Cross-cultural mental health care evaluation : developing and demonstrating methods for economic analysis.

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Abstract

Against the backdrop of the global public health burden of psychiatric disorders and the consequent need for cost-effective care and prevention strategies, this research thesis set out to develop and test methods for conducting mental health economic analysis in an international context. The objectives of the thesis were: to develop appropriate methodologies for mental health care service utilisation and cost measurement; to generate comparative service utilisation, cost and outcome data; and to explore the relationship between cost, psychiatric symptoms, quality of life, needs and disability. The thesis is based on three international, collaborative studies: an EU-funded study of the needs and costs of schizophrenia care in five European health care systems (EPSILON); an international study of the quality of life and economic correlates of major depression in primary care (LIDO); and a mental health economics demonstration project in India and Pakistan (MENDIP).

Methodological developments in the cross-cultural economic analysis of mental health care that have emerged from this work include: the development of service utilisation schedules, unit cost protocols and health system profiles for site-specific data collection; the application of emerging analytical techniques to mental health care evaluation; and the production of guidelines for mental health economic analysis.

The use of these methodologies in the three source projects of the thesis has demonstrated the feasibility of undertaking multinational comparative studies, revealed the extent of cross-cultural variation in the use and cost of mental health services, and highlighted the complex set of inter-relationships that exist between costs, needs and outcomes. The thesis concludes with a discussion of future requirements for cross-cultural mental health economic analyses and the wider mental health policy implications of key findings.

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1. Introduction

1.1 Background

An accumulating body of evidence has emerged, particularly over the last five years, which points to the immense burden that psychiatric disorders impose upon individuals, families and whole communities throughout the world (Ustün and Sartorius, 1995; Desjarlais et al, 1995; Murray and Lopez, 1996). The increasing recognition of mental health as a significant international public health issue has led to additional demands for resources that are already stretched. There is therefore a requirement to demonstrate that investment into mental health is needed and worthwhile, which translates into generating evidence on affordable and cost-effective care and prevention strategies. Such an evidence base is an important step in convincing governments that additional mental health resources will generate significant health gain and other benefits. Unfortunately, however, there is currently a dearth of good quality cost and cost-effectiveness evidence in most regions of the world for mental health interventions with proven, likely or potential effectiveness (Gulbinat et al, 1996; Srinivasa Murthy, 1996; Shah and Jenkins, 1999; Chisholm, 1999). This poses a predicament for international mental health policy-making, which is that despite the abundance of epidemiological and clinical evidence pointing to the need for investment, there is a paucity of economic evidence to guide or support these investment decisions.

Together with the responsibility of governments and health care agencies to ensure that resources are targeted appropriately, a further source of growing interest in comparative studies of disease burden relates to the multiplicity of care arrangements for people with mental illness that have emerged in different countries. To date, most multi-national studies of mental disorder have focused on establishing the prevalence of the disease and assessing outcomes cross-culturally (WHO, 1986). Such international studies represent a fundamental step forward in cross-cultural psychiatric research, most notably in terms of developing methods and measures that are applicable across diverse cultural settings, which at their best can lead to

improved planning and resourcing of mental health services for the vast numbers of people suffering from psychiatric disorders who remain unrecognised or untreated. There is little comparative research, however, which examines the relationship between inputs, processes and outcomes (Thornicroft and Tansella, 1998), or more specifically, the resource implications of care for people with mental health problems living in different countries and settings.

1.2 Research objectives and questions

The end goal of the research can be stated as the generation of cost and cost-effectiveness methodologies and data that will enable improved decision-making in the allocation of resources to mental health care at an international level. Specific objectives and key research questions of the thesis are given below:

Research objectives

- To examine cross-cultural variations in the socio-political, financial and health system context within which mental health services are provided;

- To identify and develop culturally appropriate methodologies for the international measurement of mental health service utilisation and costs;

- To generate comparative service utilisation, cost and outcome data on the basis of international studies of major psychiatric disorders and key policy issues;

- To explore the relationship between the costs of psychiatric disorders and a range of individual and country-level characteristics, including socio-demography, symptom levels, quality of life, needs and disability;

- To identify and consider key methodological and policy issues for the development and future conduct of international mental health economic analysis.

Key research questions

- What is the extent of the economic burden that psychiatric disorders impose on communities and health care services in different parts of the world?

- How do health-seeking behaviours and patterns of service utilisation vary cross-culturally for groups of people with the same psychiatric diagnosis?

- How are improvements in clinical and social domains of outcome (e.g. symptom severity, quality of life, functioning) associated with changes in service utilisation and cost?

- How do associations between symptomatology, quality of life and service costs vary across cultures?

1.3 Source projects

This thesis is based on three separate international, collaborative studies that share a number of overlapping objectives, methods and approaches. Although these studies are concerned with more than one patient group, have been undertaken in a diverse range of care settings and have differing emphases, all are characterised by an interest in the cross-cultural, comparative assessment of mental health services. The epidemiological design of the three studies is essentially observational, that is these studies are essentially aimed at examining varying patterns of health service delivery, costs and outcomes between countries, as opposed to investigating the introduction of a specific new intervention or strategy. In addition, each study includes an economic component as an integral part of the core research activities. This has enabled lessons learnt from one study to be applied to the economic aspects of other studies. Taken together, these three projects provide an appreciable new source of data on the costs of providing care to people with mental health problems in different countries, as well as an increased understanding of the inter-relationship between costs and socio-demographic, clinical and socio-cultural variables.

Schizophrenia needs and costs in five European countries (EPSILON)

The EPSILON (***E***uropean ***P***sychiatric ***S***ervices: ***I***nputs ***L***inked to ***O***utcome Domains and ***N***eeds) study is a comparative, cross-sectional study of the characteristics, needs and life qualities of people with schizophrenia in five European countries, the services they receive, and the associated costs and satisfaction levels. The study was carried out in Amsterdam, Copenhagen, London, Santander and Verona, and the project was funded under the EU BIOMED II programme. Specific objectives of the study were:

- To produce standardised versions of five instruments in key areas of mental health service research in five European languages (Danish, Dutch, English, Italian and Spanish) each of which was converted from the original into the other four languages: the Camberwell Assessment of Need; the Client Service Receipt Inventory; the Involvement Evaluation Questionnaire; the Lancashire Quality of Life Profile; and the Verona Service Satisfaction Scale;

- To compare, in five European centres, data about social and clinical variables in patients with schizophrenia, the mental health care they receive and its costs.

Some of the findings and final results of the economic component of the EPSILON study have already been reported or have been submitted for publication (Chisholm et al, 2000a, 2000b; Knapp et al, 2000; see Chapter 3 for details).

Longitudinal Investigation of Depression Outcomes (LIDO)

The overarching aim of the **L**ongitudinal **I**nvestigation of **D**epression **O**utcomes (LIDO study) is to explore the relationship between major depressive disorder in primary care patients and their quality of life and resource use, to be accomplished in a multi-centre, cross-national observational study with a prospective cohort of patients in primary care. The study was funded by Eli Lilly and Co., co-ordinated by Health Research Associates (Seattle, USA) and the participating study sites were: Barcelona, Spain; Be'er Sheva, Israel; Melbourne, Australia; Porto Alegre, Brazil;

Seattle, USA; and St Petersburg, Russia. The specific objectives relating to the economic dimension of the LIDO study were:

1. To develop a research method for the collection of health care service utilisation, associated costs data, and site-level socio-demographic and service profiles;

2. To describe and compare key domains of service use, costs and outcomes for different study sites and sub-populations;

3. To explore site-specific and cross-cultural relationships between service utilisation/costs and symptoms/QoL/functioning/treatment.

The follow-up phase of this study was still in the field at the time of submission of this thesis. Consequently, Chapter 4 is restricted to consideration of methodological aspects of the economic component of the study, together with baseline and early follow-up results only (some of which are described in Chisholm et al, 2000c).

Mental health economics demonstration project in India & Pakistan (MENDIP)

Against the backdrop of a widening recognition of the global health burden of psychiatric disorders, the **Men**tal Health Economics **D**emonstration Project in **I**ndia and **P**akistan set out to develop and test methods for conducting economic analysis of community mental health programmes in low-income countries. The research was funded by the UK's Department for International Development, and involved collaboration between the Centre for the Economics of Mental Health and the Institute for Health Sector Development (London), the Institute of Psychiatry, Rawalpindi (Pakistan) and the National Institute of Mental Health and Neurosciences, Bangalore (India). Specific objectives of the research were threefold:

- To analyse the structure, delivery and financing of mental health care in India and Pakistan;

- To develop culturally appropriate protocols, methods and guidelines for the economic analysis of community mental health care programmes;

- To generate service use, costs and outcomes data, based on a demonstration evaluation of the integration of mental health care into primary care.

The study was completed and a final report to the funding body written in 1999. Some of the key findings have subsequently been reported (Chisholm et al, 2000d; see Chapter 5 for details).

1.4 Structure and content of thesis

A chapter of the thesis is devoted to each of the three source projects, which follow a similar structure: the rationale for the study; aims, objectives and hypotheses; a detailed description of methods; presentation of results; and a discussion of key findings and implications for mental health services research and policy. The study-specific chapters are preceded by a review of the international research and policy context within which the source projects are located, including cross-cultural studies of psychiatric disorders and the contribution of health economics to mental health policy and services research. The thesis concludes with a discussion of key empirical findings, emerging issues in the cross-cultural measurement of service use and costs, and suggested directions for mental health economic analyses in the future.

The specific emphasis of the three studies differs. The primary focus of the EPSILON study was the development of a range of mental health care evaluation *measures* capable of being used widely in a European context, subsequently 'tested' for their validity and applicability - within the confines of a cross-sectional survey - on a small cohort of schizophrenia patients. At the centre of the LIDO study, by contrast, was the prospective, cross-cultural exploration of the *inter-relationships* that exist between depressive symptoms, health seeking behaviours and user outcomes, with a view to better understanding the consequences of treatment (or non-treatment) in primary care settings. Finally, the MENDIP study was primarily concerned with demonstrating the *feasibility* of applying methods of economic analysis to mental health programmes in low-income countries, exploring as it did so the relationship between access to services, subsequent uptake of services and the

impact of this uptake in terms of user outcomes. These respective differences in emphasis - instrument development in schizophrenia, cross-cultural associations in depression, and the application of mental health economics in low-income countries - are duly reflected in the reporting of the three source projects. Thus, for example, particular attention is given in Chapter 3 on the EPSILON study to the description of the development of a service receipt schedule capable of international use, whereas in Chapter 4 there is a detailed consideration of the methods required to make comparisons between countries with widely diverging health system and socio-demographic profiles.

There is of course a substantial volume of work that the thesis draws and builds on, including:

- Clinical and epidemiological research in psychiatry, including international studies of particular disorders or initiatives (e.g. Sartorius and Harding, 1983; Ustün and Sartorius, 1995; Simon et al, 1999);

- Mental health economics and policy analysis in industrialised countries, particularly in the US and the UK (e.g. Knapp, 1995; Hargreaves et al, 1998);

- International health economics research, including the development of general guidelines for the conduct of cost analysis and economic evaluation in developing countries (e.g. Creese and Parker, 1994; Mills and Lee, 1993).

What is currently missing but required is a synthesis of these different strands of research into a coherent set of methods that will allow for the appropriate and culturally-sensitive assessment of the economic costs, organisational structures and health-related outcomes of mental health care programmes internationally. The contribution of the thesis to international mental health policy can therefore be stated in terms of the provision of these newly developed and tested methods for economic analysis in this international context and the initial generation of cost and outcome data to begin filling the existing gap in such information.

1.5 Acknowledgements

A great number of researchers have been involved in the three international, collaborative projects upon which the thesis is based, all of whom have contributed in some way to the design, data collection, analytical or reporting stages of one of the studies. Acknowledgement of all collaborators in each of these studies appears at the end of the appropriate chapter. With respect to the economic aspects of these multi-disciplinary studies, individuals with whom the candidate worked closely are identified below, together with an estimate of the contribution made by the candidate towards the research reported in the relevant chapters of this thesis.

EPSILON study: The principal investigator and grant-holder for the economic component of this study was Professor Martin Knapp. The candidate co-ordinated the resource utilisation / cost aspects of this study and contributed heavily to data collection, management, analysis and reporting. Other key collaborators in the EPSILON study group who contributed to the economic component of the study were Dr Morven Leese (London), and Dr Francesco Amaddeo (Verona). (Estimated proportion of Chapter 3 that is the candidate's own work: > 70%).

LIDO study: The candidate was a project advisor, contracted by the co-ordinating agency (Health Research Associates, Seattle) to oversee the development and application of health economics methods, to provide expert analytical advice and to contribute fully towards the reporting and dissemination of study results. The other economic advisors to the LIDO study were Professor Martin Knapp (London) and Dr Greg Simon (Seattle). Dr Paula Diehr (bio-statistician; Seattle), Mr Don Bushnell and Mr Ismail Budhiarso (data management and analysis; Seattle) were other key contributors to the economic analysis. (Estimated proportion of Chapter 4 that is the candidate's own work: > 80%).

MENDIP study: The candidate was principal investigator, responsible for and undertaking overall project management, data analysis and reporting. Other investigators were Sarah James, Centre for Development Studies, Swansea; Catriona Waddington, Institute for Health Sector Development, London; K Sekar, K Kishore

Kumar, R Srinivasa Murthy (Bangalore, India); Khalid Saeed and Malik Mubbashar, Institute of Psychiatry, Rawalpindi, Pakistan. (Estimated proportion of Chapter 5 that is the candidate's own work: > 80%).

At a more general level, I am particularly indebted to my supervisor, Professor Martin Knapp, who encouraged the genesis and development of the thesis and who offered constructive support, advice and feedback at critical stages of writing; to Dr Jennifer Beecham, who generously offered to read and review drafts of specific chapters; and to other colleagues at the Centre for the Economics of Mental Health and in the Department of Health Services Research at the Institute of Psychiatry, many of whom have provided valuable inputs or new insights into a wide range of methodological and analytical aspects relevant to the multinational economic analysis of mental health care. Finally, special thanks are due to my wife Juliette, who has been a constant source of encouragement, patience and practical advice for the duration of the period of study (more or less coinciding with our married life together!).

2. Policy and research context: the cross-cultural measurement and burden of psychiatric disorders

This thesis is concerned with the development of cost:outcome methodologies and the generation of data capable of contributing towards more informed decision-making about the allocation of resources into mental health care at an international level. Its genesis arose, on the one hand, from awareness of an accumulated body of evidence from comparative and psychiatric epidemiology that has clearly pointed to the immense but under-recognised public health burden attributable to psychiatric disorders globally; and on the other, from an appreciation of the shortage of empirical evidence relating to the effectiveness and cost-effectiveness of mental health interventions in an international context.

While the enormous gap that exists in many regions of the world between identified mental health needs and allocated resources to meet these needs is in no small part a consequence of the negative (public and political) perception or stigmatisation of psychiatric disorders, the paucity of local evidence for effective and affordable interventions is a further disincentive to appropriate investment. The generation of an international, research-based evidence base for mental health service development and intervention can therefore be seen as one important component of a broader policy agenda to reduce, in currently under-served populations, the existing gap between the need for and supply of mental health care.

The focus of the thesis is on economic aspects of mental health care evaluation, but draws on the insights of other fields of research in medicine and the social sciences, including social psychiatry, psychiatric epidemiology, medical anthropology and health services research. Each of these research disciplines has added to a steadily accumulating knowledge base surrounding the aetiology, prevalence, interpretation and management of psychiatric disorders in different countries or cultures. Their relevance to the central research questions addressed in the thesis can be viewed in terms of their historical contribution to the cross-cultural measurement of psychiatric disorder, and in terms of key analytical issues or themes that they serve to highlight.

The inter-relationship between these separate fields of research was made apparent in a recent report on *World Mental Health* (Desjarlais et al, 1995; p. 43):

> *'Given the enormous human and financial costs of serious mental illness, we have much to learn from investigating social, cultural and other environmental factors that influence the course and outcome of major mental illness'*

A chronological starting point for the review of these inter-related bodies of literature is the series of WHO-sponsored international studies which have documented the course, outcome and impact of psychiatric disorders in a variety of populations and countries throughout the world. This body of literature is briefly described below, together with a critique of its core assumptions by its principal detractors (exponents of the 'new cross-cultural psychiatry'). More recent developments in international mental health policy are then highlighted, including the actual and potential contribution of health economics to the cross-cultural measurement of psychiatric disorder and disease burden.

2.1 Cross-cultural studies of psychiatric disorders

Interest in carrying out multi-site cross-cultural research into mental illness can be traced back to the convening of a WHO expert committee in 1959 on the epidemiology of psychiatric disorders (WHO, 1979b). This committee reviewed existing knowledge, stressed the need for reliable and valid data on the incidence and prevalence of psychiatric disorders, and recommended that WHO should take the lead in developing appropriate methods for undertaking epidemiological research in a cross-cultural context.

The possibility of transferring or adapting epidemiological research methods for psychiatric disorders from industrialised to low-income countries was first seriously tested in a study of psychiatric disorders among the Yoruba in Nigeria (Leighton et al, 1963), but the most notable consequence of the period of consultation following the WHO expert committee of 1959 was the development of an initial plan for the *International Pilot Study of Schizophrenia* (IPSS; WHO, 1973, 1979b). This

landmark study, a multicultural investigation of 1200 patients in nine countries, provided for the first time a standardised method for the classification and measurement of mentally ill patients in an international setting. Principal areas of interest included the effect of culture on the form, content, course and outcome of schizophrenia, as well as the development of standardised, reliable and valid methods (WHO, 1973). A comparative, prospective study design was adopted, which involved the selection of (a range of) psychotic patients aged 15-44 years who were in contact with psychiatric services. The principal measure of symptomatology was the Present State Examination (PSE; Wing et al, 1974), adjudged by the investigators to have attained satisfactory acceptability, applicability and reliability across the nine sites. Comparison of PSE-generated clinical profiles indicated a high degree of concordance for patients with a diagnosis of schizophrenia (ICD-8 code 295) between the sites.

The follow-up phase of the study focused on the course and outcome of the diagnostic groups within and between cultures (WHO, 1979b; Leff et al, 1992). A key finding of this phase of the work was that not only was the course and outcome of well-defined schizophrenia observed to be highly variable *within* centres, but there were also systematic (and statistically significant) differences in overall two-year outcome *between* centres, in particular between those in low-income countries (Agra, Cali, Ibadan) and the other six industrialised centres (Aarhus, London, Prague, Washington etc.). The better outcome found in the low-income countries, attributed to social support within the family, lower expectations and low expressed emotion within the family, was maintained at five-year follow-up (Leff et al, 1992). Other sociocultural factors that have been argued to contribute to less severe course of illness include conceptions of cause and course, the opportunity to work or engage in meaningful labour and treatment settings, with institutionalisation in particular being less conducive to health improvement (Desjarlais et al, 1995; p. 43). The better outcome observed in the low-income countries was subsequently confirmed in the successor to the IPSS, the *WHO Collaborative Study on the Determinants of Outcome of Serious Mental Disorder* (Sartorius et al, 1986; Jablensky et al, 1992), which broadly mirrored the findings of the IPSS, but which was able to draw

conclusions on a more secure footing owing to the improved, incidence-based design of the study.

Following a series of policy decisions concerning renewed commitment to primary health care by the WHO (1979a) and recognition of the need to develop and evaluate alternative and low-cost methods of mental health care (WHO, 1975), an international collaborative study on *Strategies for Extending Mental Health Care* was carried out (Harding et al, 1980, 1983; Sartorius and Harding, 1983). This study investigated the frequency and diagnosis of psychiatric disorders in primary health care settings in seven low-income countries. The investigators found that psychiatric disorders constitute a significant proportion of morbidity seen in primary health care (between 10.6% and 17.7% across the seven participating sites). The disorders detected were mainly neuroses, with psychosomatic symptoms being the most common presenting complaint. The high rate of somatic complaints was argued to be a key factor behind a further important finding of the study, which related to the relatively low level of detection of psychiatric disorder by (trained) primary care workers in the study areas (only one-third of research-diagnosed cases were identified). Few cases of psychoses were identified, in part due to lower incidence rates of serious mental illness but also because psychotic patients are not so inclined to seek care and treatment at the primary care level. In reaching this conclusion, the study explicitly raised the important economic and policy issue of the relative prioritisation to be accorded to providing services to the numerically few but symptomatically more severe people with psychoses as compared to the much greater number of people with more common and less severe psychiatric disorders (mainly depression and anxiety).

The impact of depressed and anxious patients on the caseloads of primary health care professionals has been investigated by a series of further WHO international studies. A *WHO Collaborative Study on the Assessment of Depressive Disorders*, conducted in four cultural settings (Nagasaki, Montreal, Basle and Teheran), compared the characteristics of patients with depression presenting at primary care facilities (Jablensky et al, 1981; WHO, 1983). The study provided evidence, as the IPSS had for schizophrenia, that the characteristic syndrome of depression exists in different

cultural settings and includes symptoms which can be assessed clinically in a very similar manner across diverse settings. The results of the 10-year follow-up study of course and outcome for the proportion of these patients for whom data could be collected (46%) showed that one-third had had at least one readmission, of whom about one-half had experienced a deterioration or no change in health status, while a further quarter had moderately good outcome without readmission (Thornicroft and Sartorius, 1993). The other major measure of outcome used referred to suicide: 11% of all patients completed suicide in the follow-up period, and 14% made unsuccessful attempts in the same period.

A further cross-cultural investigation carried out under the auspices of the WHO was the *Pathways to Psychiatric Care Study*, a systematic examination of the Goldberg and Huxley model (1980) which described the referral pathways taken by 1554 patients newly referred to mental health services in 11 countries (Gater et al, 1991). The investigators found that the pathways in centres relatively well-provided with psychiatric staff (Granada, Manchester, Havana etc.) were dominated by general practitioners and to a lesser extent hospital doctors, whereas the relatively less well-resourced centres (Bangalore, Rawalpindi and Ujung Pandang) showed a variety of pathways with native healers often playing an important role. In keeping with other similar studies, somatic problems were a common form of presentation in all centres. A key finding was that delays along the pathways to care were relatively short, irrespective of psychiatric resources, although in certain centres longer delays on pathways involving native healers were observed.

The most recent report to document the dramatic impact of psychiatric disorder in primary health care settings is the *WHO International Study of Psychological Problems in General Health Care*, carried out in 15 primary care sites across both industrialised and low-income regions (PPGHC study; Ustün and Sartorius, 1995). Overall, primary care physicians identified 23.4% of attendees as being a 'case' with a psychological disorder (while a research instrument identified 33%). The most common psychiatric disorders in all centres were depressive disorders (10.4%) and anxiety disorders (7.9%). Patients with psychiatric disorder, particularly those with depression, perceived their health status to be poor and experienced physical and social

disability that exceeded that of people with common chronic physical diseases such as diabetes, arthritis and back pain (Ustün and Sartorius, 1995; Ormel et al, 1994). The primary care physicians reported that they provided treatment to 78% of cases whom they identified as having a psychological disorder (around half are given counselling, a quarter sedative medication and only a sixth receive anti-depressants).

The principal finding of the PPGHC study was that significant amounts of psychiatric morbidity across all centres went untreated or undetected, which in turn raised critical issues relating to the appropriate training of primary health care workers in the recognition and management of psychiatric disorders, as well as the availability and supply of pharmacological and psychological forms of treatment for these disorders. The failure to recognise psychological disorders appeared to be particularly marked in those who presented with somatic symptoms or with a pre-existing physical illness, but the organisation of care provision also appeared to be important: centres with 'individualised care' (a personal physician responsible for co-ordinating the patient's care and who the patient sees by appointment) had higher rates of detection than centres using a 'collective care' model (patients attend a clinic without an appointment and see whichever doctor is there on that day).

This series of international studies represented a fundamental step forward in cross-cultural psychiatric research, most notably in terms of developing methods and measures that are applicable across diverse cultural settings. This process of standardisation, resulting in a common language of diagnosis and outcome measurement, has allowed for the subsequent communication, exchange and comparison of epidemiological findings from different parts of the world. Put to their best use, such research findings can lead to improved planning and resourcing of mental health services for the vast numbers of people suffering from psychiatric disorders who remain unrecognised or untreated. At their worst, these studies have been viewed as 'psychiatric imperialism', involving inappropriate attempts to 'impose Western concepts of psychopathology on non-Western peoples' (Leff, 1990; p.305). The source of such criticism has been advocates of the so-called 'new cross-cultural psychiatry', brief consideration of which now follows.

2.2 Psychiatric disorders from a sociocultural perspective

The traditional transcultural psychiatric approach had satisfied itself with focusing on the identification of variations and similarities in the frequency and patterns of symptoms across cultures, with a view to constructing improved and universally valid conceptual models of psychiatric disorder (Kleinman, 1977; Littlewood, 1990). In a comprehensive review of depressive disorders from a transcultural perspective, for example, Singer (1975, p. 297) concludes that 'the evidence does not support the view that culture influences the morbidity of depressive disorders……the concept of depressive disorder as it is held in the West emerges as universally valid'. The 'putative rarity of depressive disorders' and 'pronounced somatisation and hypochondriasis in depressives' outside the Western cultures are put down to faulty study sampling, the reported rarity of suicides is regarded as an unreliable indicator in comparative studies, while 'the alleged increase in morbidity with increasing complexity of civilisation probably reflects an increase in availability of psychiatric facilities and a broadening of concepts of psychiatric disorder' (ibid). In a similar review of psychiatry in Africa, German (1987; p. 445) argues that 'the medical model - or perhaps more precisely the Western nosological model - seems capable of adequately accounting for the nature of the majority of these African mental ill-health problems'.

Singer's review and other studies of the 'old cross-cultural psychiatry' have been castigated by Kleinman (1977, p.3) as a 'breathless search through large amounts of data from different societies looking for universals'. Using material from field research in Taiwan and from other anthropological investigations, Kleinman argued that there *are* significant cross-cultural differences and that these differences are a function of the cultural shaping of normative and deviant behaviour: 'culture does considerably more than shape illness as an experience; it shapes the very way we conceive of illness' (ibid). Underlying this proposition is a vital distinction between disease and illness: disease refers to malfunctioning of biological or psychological processes, whereas illness is the personal and cultural reaction to disease. In this respect, illness is by definition a cultural construct. The depressive syndrome, for example, is argued to be 'a cultural category constructed by psychiatrists in the West

to yield a homogeneous group of patients' (1977, p.3). The assumption that Western diagnostic categories are themselves culture-free entities has been labelled as a 'category fallacy'; rather, such categorisation should be viewed as an 'explanatory model' specific to the Western context (Kleinman, 1980).

The fundamental implication of this paradigm shift - in anthropological terms a move away from cultural universalism to cultural relativism - is that local meanings of mental illness, and individual or institutional responses to it, should be elicited and understood *before* attempting any comparisons across societies (Bracken, 1993; Chisholm and Bhugra, 1997). Accordingly, the International Pilot Study of Schizophrenia (WHO, 1973) - and other related studies - have come under fire for starting from 'a category fallacy which significantly limits its value as a study of cultural interactions on mental illness....it can tell us almost nothing about the relationship of culture to either the group it includes or the larger one it excludes' (Kleinman, 1977, p.4). In particular, the use of the Present State Examination (Wing et al, 1974) attracted criticism as a measure conceived and developed in the West, subsequently imposed - cultural assumptions and all - on other societies (Fernando, 1988; Kleinman and Good, 1985).

While the 'new cross-cultural psychiatry' has generated important insights into the feasibility or desirability of comparative, cross-cultural psychiatric research, Leff (1990) reasonably questions the practicality of undertaking the kind of exhaustive phenomenological descriptions envisaged by cultural relativists in all subsequent comparative research studies, and asks whether previous research failing to meet these criteria needs to be discounted (in Leff's terms, a case of 'throwing the baby out with the bath water'). One simple response to this relates to the position on a spectrum - extending from symptomatic psychoses, through schizophrenia and the neuroses, to the more 'culture-bound' conditions such as bulimia and drug overdose - that the clinical condition under cross-cultural investigation occupies, the implicit assumption being that culture exerts a stronger influence at the sociological than at the biomedical pole (Littlewood, 1990). With respect to schizophrenia, there are a sufficient number of completed ethnographic studies in Africa and elsewhere to suggest a reasonable degree of congruence with regard to the signs by which insanity

is recognised in different culture (even if explanatory models of the causation of insanity may differ widely). In the opinion of Murphy (1994), this congruence helps to cast a rather warmer light on the findings of the IPSS and related studies. Investigations of depression, by contrast, indicate a more culturally-constructed manifestation of underlying disease: for example, Kleinman (1982) indicates that the kind of depression which Chinese psychiatrists and their patients call neurasthenia is a culturally-constructed form of depression in which somatic symptoms are emphasised over psychological symptoms.

2.3 The burden of psychiatric disorders

Mental health and DALYs: The Global Burden of Disease study

Building on the achievements of earlier collaborative work, and drawing on an increasingly wide range of disciplinary contributions, international mental health policy in the 1990s has seen a number of key developments. Perhaps the most important of these developments relates to the *Global Burden of Disease* (GBD) study compiled by the Harvard School of Public Health, the WHO and the World Bank, which for the first time attempted to assess not only the mortality effects but also the disabling consequences of disease (World Bank, 1993a; Murray and Lopez, 1996). A key finding of this monumental piece of work - and to many outside the mental health field, a surprising one - was that by combining the mortality and disability effects of disease into a single metric, the Disability Adjusted Life Year (DALY), the massive burden of global disease attributable to non-communicable disease, and neuropsychiatric disorders in particular, became readily apparent.

Investing in Health (World Bank, 1993a) calculated that neuropsychiatric disorders accounted for 8.1% of the global burden of disease in 1990. In the final report of the *Global Burden of Disease* study, the proportion of GBD caused by neuropsychiatric disorders was revised upwards to 10.5% (Murray and Lopez, 1996). The latest estimate for 1998, given in *The World Health Report 1999*, is 11.5% of GBD for all member states, 23.5% in high income countries and 10.5% in low and middle income

countries (WHO, 1999). Major depression is the leading cause of disability world-wide, owing to high rates of prevalence (particularly among women), non-detection (90% in many regions) and severity (a disability weight of 0.6 out of 1 in untreated form). Psychiatric disorders account for five of the ten leading causes of disability – unipolar depression, alcohol abuse, bipolar affective disorder, schizophrenia and obsessive compulsive disorder (Murray and Lopez, 1996). The burden imposed by these disorders is projected to increase to 15% of GBD by the year 2020, largely as a result of demographic trends such as the increased number of elderly individuals and consequent cases of dementia (Shah and Ames, 1994; Jenkins, 1997a).

The significance of DALYs in highlighting the burden of disease attributable to different health conditions and causes of mortality (including psychiatric disorders) at global and regional population levels cannot be overstated, since it represents a fundamental move forward in bridging the gap between mortality and the effects of morbidity. Adopting techniques developed in the field of health economics, DALYs share many of the characteristics and limitations of Quality Adjusted Life Years (QALYs). The key distinction between the two measures is that QALYs are an output to be gained (quality of life being a positive outcome domain) while DALYs are an output to be averted through health care interventions. The outstanding feature of both forms of measurement is that they offer a set of parameters and dimensions with which to compare interventions for different *conditions*, as well as for different *interventions* for a specific condition under investigation. They also provide an *explicit* framework within which to assess the relative burden of disease or the relative effectiveness of alternative interventions, in terms of the methodological assumptions employed, the trade-offs that individuals are prepared to make between longevity and quality of life or disability and the weightings that are consequently accorded to different health states and client groups (Chisholm et al, 1997a).

In attempting to capture disease burden or health improvements in a single numerical index, however, DALYs and QALYs fall prey to a number of well-founded criticisms concerning the placement of values on states of health and the scales along which these values are measured. In relation to DALYs, for example, disability severity weights were specified and derived by health care experts alone, which casts

doubt on the validity of both the conceptualisation of disability used and the valuation base adopted (Arnesen and Nord, 1999). The findings of the GBD study are also weakened by the fact that results, particularly for developing regions, are based on inadequate or poor epidemiological data with respect to rates of prevalence, detection and treatment, which reduces the credibility of the findings to local policy-makers. A further limitation of the GBD study is that there is currently little indication on a practical level of how DALYs are to be systematically linked to cost-effectiveness evidence for improved health care decision-making and priority-setting. DALYs are *not* in themselves sufficient as a mechanism for resource allocation and priority-setting in health care (Anand and Hanson, 1997; Sayers and Fliedner, 1997); for these tasks, there is a need for an additional component, cost, which can be related subsequently to derive costs per DALY for different interventions.

The economic burden of psychiatric disorders: cost of illness studies

The burden or consequences of psychiatric disorders can also be usefully gauged from an economic perspective. Psychiatric disorders impose a range of costs on individuals, households, employers and on society as a whole (Box 2.1).

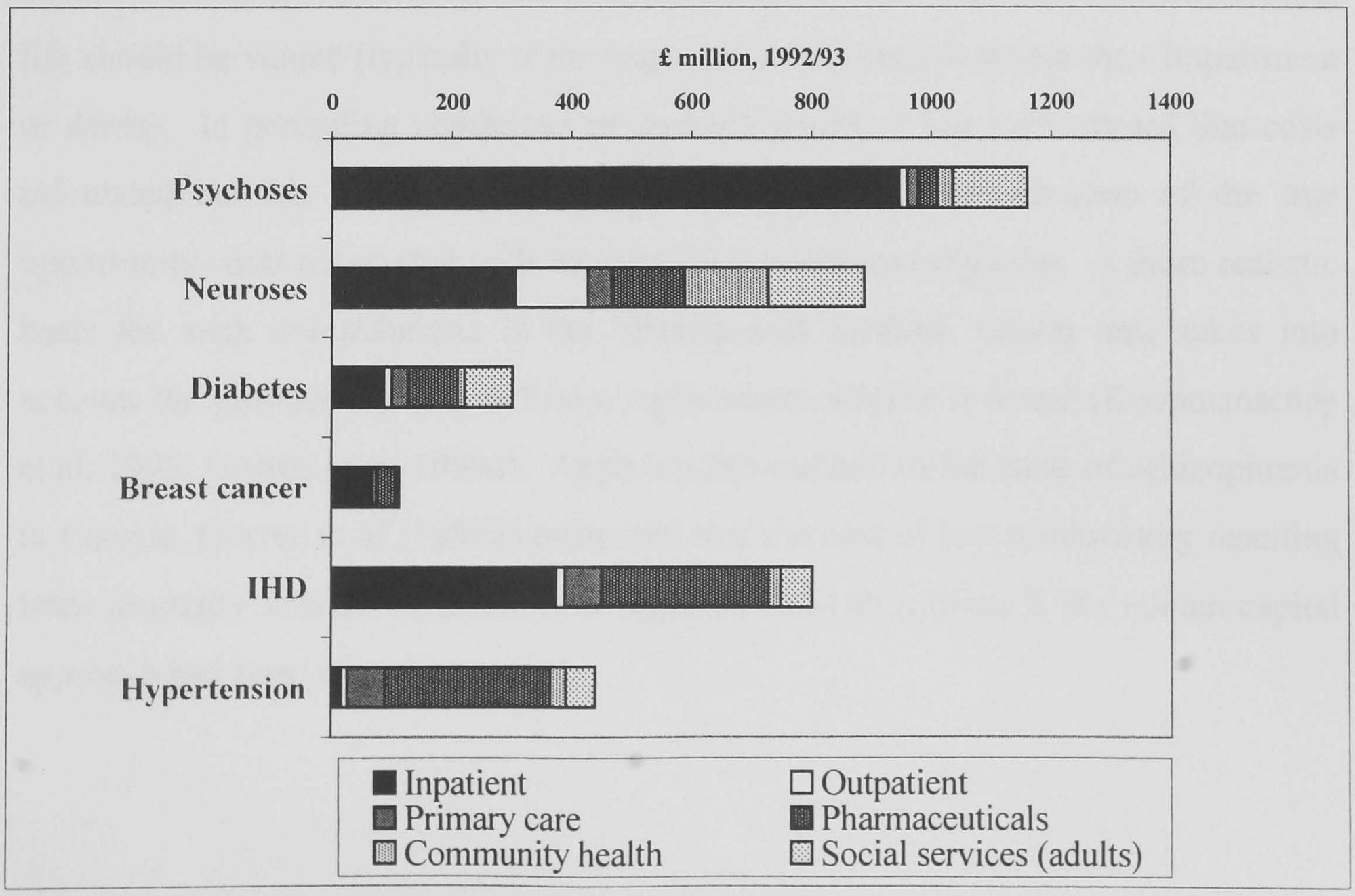
Box 2.1 The burden of psychiatric disorders: a cost matrix

	A. Care costs	**A. Productivity costs**	**A. Other costs**
1. Sufferers	Treatment and service fees / payments	Work disability Lost earnings	Anguish/suffering Treatment side-effects Suicide
2. Family and friends	Informal care-giving	Time off work	Carer burden
3. Employers	Contributions to treatment & care	Reduced productivity	-
4. Society	Provision of MH & general medical care (taxation/insurance)	Reduced productivity	Loss of lives Untreated illness (unmet need)

The overall economic burden associated with psychiatric disorders has been estimated in a series of 'cost of illness' studies which attempt to attach monetary values - as opposed to DALY estimates - to these various societal costs, typically expressed as an annual estimate aggregated across all involved agencies for a whole country. Such studies have direct parallels with epidemiological estimates of disease burden, in the sense that the principal aim is to influence policy-making and resource allocation by demonstrating the relative magnitude or burden of economic costs associated with a particular disorder. Since no measures of outcome enter into these analyses, cost of illness studies cannot be considered as examples of economic evaluation *per se*, nor are they capable of demonstrating directly how resources should be allocated across different health care interventions.

A recent comparative study of the *Burdens of Disease* carried out within the UK's National Health Service demonstrated the relative and absolute costs of care for a wide range of disorders, including the comparatively high annual expenditure associated with chronic disease conditions such as neurosis and psychosis (NHS Executive, 1996; Figure 2.1).

Figure 2.1 NHS Burdens of Disease (NHS Executive, 1996)



Using these and other data, Patel and Knapp (1998) attempted to calculate the aggregate costs of all psychiatric disorders in the UK, arriving at an estimate of £32 billion (1996/97 prices). This included not only the direct costs of health and social service provision and treatment for people with mental health problems, but also costs to the criminal justice system, costs to informal carers and lost work productivity as a result of suicide and impairment. The costs of lost productivity accounted for 45% of overall costs.

The economic burden associated with schizophrenia and depression has been estimated in a series of similar 'cost of illness' studies carried out in a small number of countries (see Table 2.1 for a summary). Comparison between studies is complicated by the heterogeneity of methods used, for example whether an incidence or prevalence based approach is adopted, or whether the costs associated with premature mortality have been included. However, where a comprehensive estimate has been obtained, a common feature of these studies is that the lost productivity costs exceed the direct costs of care and treatment, sometimes by as much as six or seven times (Stoudemire, 1986; Kind and Sorensen, 1993).

These high estimates of lost productivity costs are attributable to the use of a 'human capital' method of calculation, which assumes that all lost days of an adult's working life should be valued (typically at the wage rate of the person before their impairment or death). In prevailing conditions of unemployment, it has been argued that costs calculated on this basis represent an exaggeration or overestimation of the true opportunity costs associated with the condition under investigation. A more realistic basis for such computations is the 'friction-cost method', which only takes into account the productivity lost before a replacement worker is found (Koopmanschap et al, 1995; Goeree et al, 1999a). Applying this method to the costs of schizophrenia in Canada, Goeree et al (1999b) estimated that the cost of lost productivity resulting from mortality was $1.53 million, as opposed to $105 million if the human-capital approach had been used.

Table 2.1 The economic burden of depression and schizophrenia: cost of illness studies

Authors	Country	Year	Type (I/P)[a]	Direct costs	Indirect costs	Total costs	Ratio Dir : Indir	Comment
Depression								
West (1992)	UK	1990	P	£333 million	-	-	-	NHS costs only; crude method of calculation
Kind & Sorensen (1993)	UK	1991	P	£417 million	£2.97 billion	£3.39 billion	12 : 88	
Jonsson & Bebbington (1994)	UK	1990	P	£222 million	-	-	-	ICD-9 codes 296, 311 only; underestimation
Stoudemire (1986)	USA	1980	P	$2.1 billion	$14.2 billion	$16.3 billion	14 : 86	Major depression only
Greenberg et al (1993)	USA	1990	P	$12.4 billion	$31.3 billion	$43.7 billion	28 : 72	Updated/extended version of Stoudemire et al
Rice & Miller (1995)	USA	1990	P	$19.8 billion	$10.5 billion	$30.4 billion	35 : 65	ICD-9 codes 296, 298.0 and 311
Schizophrenia								
Andrews et al (1985, 1991)	NSW, Australia	1975	I	$24.6 million	$114 million	$139 million	18 : 82	NSW data converted into $US; estimates sensitive to scenario analyses (Andrews, 1991)
Goeree et al (1999)	Canada	1996	P	C$1.1 billion	C$1.2 billion	C$2.35 billion	48 : 52	Comprehensive; Friction cost method used
Evers & Ament (1996)	Holland	1989	P	G 778 million	G 66 million	G 844 million	92 : 8	Mortality costs not included
Davies & Drummond (1994)	UK	1991	I	£397 million	£1.7 billion	£2.1 billion	19 : 81	Non-NHS agency costs excluded
Knapp (1997)	UK	1993	P	£1.4 billion	£1.2 billion	£2.6 billion	54 : 46	Not complete (mortality); aggregation not clear
Guest & Cookson (1999)	UK	1997	I	£88 million[d]	£84 million[d]	£172 million[d]	51 : 49	Comprehensive; discret event model of 1st 5 yrs
Gunderson & Mosher (1975)	USA	1975	P	$2-4 billion	$9-11 billion	$11-19 billion	33 : 66	
Rice & Miller (1995)	USA	1990	P	$15.9 billion	$17.1 billion	$32.5 billion	48 : 52	Includes mortality & non-health agency costs
Wyatt et al (1995)	USA	1991	P	$19 billion	$46 billion	$65 billion	29 : 71	Similar methods / data to Rice & Miller (1995) but future earnings not discounted

[a] Type of study: I = Incidence-based study; P = Prevalence-based study; [d] Mean annual cost, discounted at 6%

As with the *Global Burden of Disease* study, estimates of the economic burden of disease provide a useful research and policy context within which to investigate interventions or strategies that are capable of making an impact on this identified burden in terms of clinical and cost-effectiveness (Rupp et al, 1998). However, cost of illness studies in mental health have been very much concentrated on two psychiatric disorders in only a handful of countries (which arguably reflects the willingness of pharmaceutical companies to sponsor many of these studies as a marketing strategy for the launch of a new product in these markets). As such, they have limited relevance to a more international perspective of the economic burden associated with a broader range of psychiatric disorders in the global population. Furthermore, there remains an outstanding concern that the reliance on a human capital approach leads to an over-estimation of the total cost burden. Currently, therefore, DALYs would appear to constitute the most internally consistent and universally valid metric for assessment of the burden of disease in an international context. This prompts the question of what are the key policy-orientated objectives and methodological principles that mental health economics must pursue in order to usefully inform international mental health policy dialogue and resource allocation?

2.4 International mental health policy and economics

Recent developments in international mental health policy

Despite the weaknesses of some of the underlying data, the overall conclusion reached in the GBD study that psychiatric disorders, and depression in particular, constitute a major public health problem that on a global level largely goes unrecognised and untreated is widely accepted by mental health professionals and researchers. Outside the mental health arena, however, the newly recognised burden attributable to psychiatric disorders has received a less positive response. Indeed, despite the burden of psychiatric disorder that the 1993 World Bank report *Investing in Health* pointed to, it did not suggest that mental health should belong to the package of essential clinical services, indicating therefore that mental health services should somehow be viewed as discretionary.

Promulgation of the neglected state of mental health at an international level has come instead from *World Mental Health* (Desjarlais et al, 1995), co-ordinated by the Department of Social Medicine, Harvard Medical School. This report specifically concerned itself with amassing salient facts, figures and arguments pertaining to the burden of suffering imposed by mental and psychosocial health problems on low-income countries in Asia, Africa, Latin America and the Middle East. A particular feature of the report is its emphasis on the social and economic context in which mental and behavioural health problems occur, as made clear at the outset (Desjarlais et al, 1995; p. 3):

> *'World mental health is first and foremost a question of economic and political welfare. Although the links between social forces and ill health are complex and varied, close inspection suggests that mental health concerns almost always relate to more general concerns that have to do with the economic welfare of a family or community, the environment in which a person lives, and the kinds of resources that he or she can draw on'.*

Pursuing this broad approach, chapters of the report are given up to consideration of issues specific to children and youth, women and the elderly, as well as the effects of dislocation on mental health. In so doing, clear relationships are made apparent between mental health and the effects of poverty and urbanisation, important links not only for an increased understanding of the impact of material or service-related poverty as a determinant of outcome (Harpham, 1994; Saraceno and Barbui, 1997), but also in engaging the interest and involvement of international agencies, such as the World Bank, USAID and the UK Government's Department for International Development, whose mission in the health sector is closely related to the alleviation of poverty. On the basis of the report's findings, the authors made a plea for mental health to be placed on the international agenda, backed up by recommendations and specific initiatives for meeting the challenges posed. The report was presented to the United Nations, which subsequently has set up a major initiative entitled 'Nations for Mental Health', the overall objectives of which are to raise awareness about the burden of psychiatric disorders, to support countries while they plan and implement strategies for reducing this burden, and to promote technical co-operation between countries (Jenkins, 1997b).

For a report that is focused on the mental health problems and priorities of low-income countries, however, the paucity of evidence reported in *World Mental Health* on the costs and relative cost-effectiveness of alternative policies or programmes - which is and must be a critical criterion for successful implementation and sustainability - represents a notable gap in coverage. Even in drawing up an agenda for research on mental health services, no mention is made of the need for new evidence relating to low-cost but effective care and prevention strategies. One probable reason why the report is able to do little more than pay lip-service to issues of cost-effectiveness is that there is currently a dearth of data relating to these concerns in low-income countries. Such a lack of data is also one important factor behind, for example, the World Bank's guarded position regarding supporting mental health care activities. At a two-day awareness-raising workshop for World Bank staff ('Mental Health and Development: what can the World Bank do?'; September 1998), it was clearly stated that two key preconditions for World Bank assistance and support included explicit prioritisation of mental health by national governments seeking help and the existence of robust evidence relating to the cost-effectiveness of new interventions or strategies for mental health care.

International mental health care policy is consequently faced with an apparent predicament, which is that despite the abundance of epidemiological and clinical evidence pointing to the need for investment, there is a scarcity of *economic* evidence to guide or support these investment decisions. The extent to which this is a valid characterisation of the state of international mental health policy and economics is reviewed below.

The contribution of health economics to international mental health

The increasing recognition of mental health as a significant international public health issue has led to additional demands for resources that are already stretched (Desjarlais et al, 1995; p. 67):

> *"Economic constraints, particularly those resulting from mandated efforts to restructure economies, have placed extreme limits on governments' abilities to develop new services or extend successful programmes. In the context of scarcity,*

> *mental health services are seldom given high priority by national governments or by international aid programmes. The importance of addressing the wide-ranging problems [associated with] mental and behavioural problems ..... should be recognised as crucial for both human and economic development."*

There is therefore a requirement to demonstrate that investment is needed and worthwhile, which translates into generating evidence on affordable and cost-effective mental health care and prevention strategies (Chisholm, 1999). Such an evidence base is an important step in convincing governments that additional mental health resources, most notably in training, effective psychotropic drugs and basic infrastructures, will generate significant health gain and other benefits. The need for mental health economic evidence is made clear in the WHO's strategy on mental health policy and care (Gulbinat et al, 1996; p. 533):

> *"Health policy decision makers are looking for cost-effective options in the organisation of mental health care at a time when international comparative studies of mental health services are extremely limited, indeed almost non-existent"*

Mental health economics as a topic and a discipline has much to offer in filling this gap. Most significantly, by valuing the costs and outcomes of alternative interventions or strategies, it is able to go beyond epidemiological estimates of the burden of psychiatric disorder (expressed in DALYs or other units of measurement) by demonstrating what can or should be done to respond to this known burden. This branch of health economics, economic evaluation, has developed at an exponential rate since the early-1970s, and there is no sign of this rate diminishing, as governments, health agencies and insurers alike bid to contain the costs of health care or subject the introduction of new technologies to a prior evaluation of their costs and benefits. Health economics as a discipline can also contribute to policy discussion through examination of the patterns of employment, the forces of demand and supply, the roles of markets in resource and treatment allocation, and the incentives and disincentives to better practice (Donaldson and Gerard, 1993; Chisholm and Stewart, 1998). Much of the mental health services research carried out in the US has in fact focused on mental health care financing, including reimbursement systems and insurance mechanisms (Frank and Manning, 1992).

The prevailing problem that is being addressed by economic analysis is one of resource scarcity. The ubiquity of resource scarcity, relative to needs, translates into a requirement to make choices about how these scarce resources should be most appropriately allocated. At the most aggregated level, a government could decide, say, to double its budgetary allocation to mental health care: while this undoubtedly would have many positive impacts, there would in all likelihood remain an outstanding pool of unmet mental health need in the population. Moreover, the decision to allocate a greater volume of resources to mental health care – in a constrained, publicly funded system, at least – impacts on the resources available for other health or welfare programmes that may equally deserve additional investment. At the level of mental health purchasers and providers, resource scarcity prompts the need to gather data or evidence with which to evaluate the clinical and cost effectiveness of new and current therapies. Purchasers, for example, require information on the relative worth of alternative interventions in order to improve or maximise the health gain of their local populations.

The two fundamental objectives of economic analysis are to improve both the efficiency with which health care resources are employed and to target those resources on needs and demands (the equity objective). Efficiency is first and foremost concerned with establishing that health care programmes are worthwhile, in the sense that their benefits exceed their costs (allocative efficiency); at a technical level, efficiency is concerned with ensuring that best use is made of the scarce resources channelled into these worthwhile programmes. Efficiency therefore provides a framework with which to determine an optimal allocation of resources to various programmes of health care expenditure. Equity considerations revolve around the ideas that each person must be given their due and equals must be treated as equals. Discussions about justice or equity at a policy level have typically concentrated on the distribution or redistribution of (scarce) resources, which in the context of mental health care is typically determined by need and expressed in terms of access to or utilisation of services (Chisholm and Stewart, 1998).

Despite the need for economic analysis, there remains a paucity of completed mental health economic evaluations from both developed and developing countries (Evers et

al, 1997; Shah and Jenkins, 1999). Although the study of mental health and economics can be traced back forty years (Fein, 1959), it is only in the last twenty years that evaluative studies have begun to emerge. In the US, Weisbrod et al (1980) applied (partial) cost-benefit analysis to Assertive Community Treatment, a model of care that has dominated policy discussions of alternatives to hospital care ever since (Latimer, 1999); the model was also applied and evaluated in a UK context (the Maudsley Hospital's Daily Living Programme), including a cost-effectiveness analysis (Knapp et al, 1998). Other evaluative studies that have had a significant bearing on UK policy includes the reprovision of long-term care from hospital and the development of community care (Hallam et al, 1994; House of Commons Social Services Committee, 1990).

The preponderance of completed economic evaluations in mental health care have been concerned with more specific treatment modalities for psychoses and affective disorders, in particular the cost-effectiveness of different psychotropic medications and, more recently, various psychotherapeutic approaches to the management of these psychiatric disorders. Since the 1950s, the treatment of schizophrenia and depression in industrialised countries has been dominated by pharmacotherapy, initially neuroleptics and tri-cyclic anti-depressants (TCAs), now increasingly so-called atypical anti-psychotics and newer anti-depressants such as selective serotonin re-uptake inhibitors (SSRIs). The weight of evidence points to the superior cost-effectiveness of SSRIs over TCAs and atypical over conventional anti-psychotics, however there is still no definitive evidence that demonstrates clear dominance (both in terms of costs and outcomes) for these newer drugs (Woods and Baker, 1997; Hotopf et al, 1996; Knapp et al, 1999). Encouraging evidence is emerging in relation to the cost-effectiveness of psycho-therapeutic approaches to the management of depression and schizophrenia, but again there is a need for more prospective studies with sufficient sample sizes and cost coverage to definitively address the issue of cost-effectiveness of these alternative interventions (Gabbard et al, 1997; Knapp, 1999).

Over the last few years, one or two studies have emerged from developing countries, including consideration of the cost-effectiveness of screening for mental illness in

primary care settings in Brazil and India (Sen et al., 1987; Isaac and Kapoor, 1980), family therapy for schizophrenia in rural China (Xiong et al., 1994), home versus hospital care in rural China (Wang et al., 1994) and post-discharge home visiting by nurses in South Africa (Gillis et al, 1989). In Guinea-Bissau, the evaluation of a comprehensive mental health service developed through the primary health care system achieved a favourable balance of costs and benefits (De Jong, 1996). Most of these studies, however, are modest in their design, size, coverage and generalisability (Shah and Jenkins, 1999).

The paucity of mental health economic evaluative studies generally, and in low-income countries in particular, is a significant stumbling block to the investment of resources in mental health by governments and international agencies. The attention that the epidemiological reports reviewed above (in Sections 2.1 and 2.3) have brought to policy-makers, together with developments in the effective treatment of mental illnesses and the steady move towards more community-based models of care (Sartorius et al, 1993; WHO, 1979), offers an important opportunity not only to reinforce the need for appropriate programmes of care and prevention, but also to address the key issues of their affordability and sustainability.

For economic contributions to international mental health care to be appropriately targeted on key policy issues and pursued in a consistent manner, there is an evident need for an overall framework or strategy within which inputs can be made. At a general level, economic considerations already comprise part of the WHO's strategy (Gulbinat et al, 1996), the goals of which are: i) to survey existing sources of data, information and knowledge; ii) to establish a multinational information resource based on a common framework; and iii) to conduct needed studies, including comparative studies of financing, costs, service utilisation and cost-effectiveness. Implementation of this broad agenda, however, requires more detailed consideration of the necessary principles and procedures that underpin such efforts.

There is in fact broad agreement on the essential methodology that underpins the economic evaluation of health care programmes (Drummond et al, 1997; Gold et al, 1996), and a number of texts specific to mental health care evaluation have also

recently emerged (Knapp, 1995; Hargreaves et al, 1998). An important analytical framework (originally developed with reference to social care) that underlies many completed studies in the UK is the 'Production of Welfare', which models the inter-relationships between resource and non-resource inputs and intermediate and final outcomes (Knapp, 1984); an exposition of its application to mental health care, together with practical illustrations of policy-orientated research in the UK context, can be found in Knapp (1995).

Conceptual and definitional consensus is an important and necessary first step towards a standardised approach to the assessment of costs and outcomes, but is by no means sufficient to ensure that similar methods are used *in practice*. In fact, there is limited value in searching for a single, universal form of economic evaluation, since the precise form that an evaluation takes will depend on the nature of the problem under investigation, the study's perspective and the feasibility of measuring all identified costs and consequences. Rather, the requirement is for transparency in the approach that has been adopted, and adherence to a number of guiding principles (e.g. Drummond et al, 1997; Gold et al, 1996; Johnston et al, 1999).

Over and above pursuit of these principles, there is a further set of issues that specifically arise from the conduct of multi-site or comparative international studies, including the heterogeneity of health care financing and delivery arrangements across countries, the identification of mutually acceptable service categories and definitions, translation and cross-cultural validation of service utilisation measures, and adjustment of the costs of services to take into account known distortional factors and differences in relative purchasing power in different economies. There is currently little guidance or empirical evidence relating to the incorporation of these additional methodological concerns into multinational economic analysis (Drummond et al, 1992), but without addressing and resolving these issues the measurement and comparison of mental health-related costs and outcomes can be expected to be flawed from the outset.

2.5 Emerging themes

In this chapter, a series of inter-related research disciplines and studies that have an important bearing on the cross-cultural measurement and burden of psychiatric disorders have been reviewed, in order to provide the research and policy context within which the three source projects were undertaken. Out of this inter-disciplinary review, a number of key themes emerge which have particular relevance to the development and application of methods for economic analysis in cross-cultural mental health care evaluation. These include:

- the significant variation, within and between countries, in the course and outcome of psychiatric disorders (WHO, 1979b; Leff et al, 1992; Simon et al, 1999), and in the pathways to, availability and organisation of care for people with psychiatric disorders (WHO, 1975; Gater et al, 1991);

- the conceptual distinction between universal versus relativist models of psychiatric disorder and individual or institutional responses to it (Kleinman, 1987); or in other words, do local differences over-ride international comparisons?

- the sizeable burden that psychiatric disorders impose on local health care services (Harding et al, 1980, 1983; Jablensky et al, 1981; Ustun and Sartorius, 1995) and on overall levels of global mortality and disability (Murray and Lopez, 1996); and

- the limited availability of appropriate methodologies and high quality international evidence relating to the costs and cost-effectiveness of different mental health care interventions, relative to the need for such data.

Each of these themes resonate through the following three chapters and are picked up again in greater depth in the concluding chapter of the thesis.

3. Schizophrenia needs and costs in five European countries: the EPSILON study

3.1 Rationale

3.1.1 The public health burden of schizophrenia

The public health impact of schizophrenia can be gauged according to a number of criteria, covering: (i) frequency; (ii) severity; (iii) consequences; (iv) availability and acceptability of interventions; and (v) public concern (Thornicroft and Tansella, 1999). In terms of *frequency*, schizophrenia has a low incidence. In an extensive review of international studies (Warner and de Girolamo, 1995), including the *WHO Collaborative Study on the Determinants of Outcome of Serious Mental Disorder* (Jablensky et al, 1992), the incidence rates ranged from 0.07 to a maximum of 7.1 per 1000 population per year. The wide range is accounted for more by methodological differences that any heterogeneity of environmental or genetic factors (Hafner and der Heiden, 1999). Since schizophrenia is commonly a lifelong condition, its prevalence is higher than its incidence. The above review estimated the age-corrected prevalence rate of schizophrenia to be 5.8 per 1000 population (Warner and de Girolamo, 1995). The lifetime prevalence of schizophrenia is about 1%.

As far as *severity* and *consequences* are concerned, the burden of schizophrenia can be expressed in terms of suffering caused by a range of symptoms, lower quality of life, loss of independence, poorer social integration and higher mortality. Key 'positive' symptoms of schizophrenia include hallucinatory voices and delusions of thought, control and influence, while 'negative' symptoms include incoherent speech, catatonic behaviour and social withdrawal (Wing, 2000). After a first episode, approximately 25% of individuals make a good recovery within five years, two-thirds will have multiple episodes with a variable degree of disability, and 10-15% will develop severe continuous disability from negative symptoms (ibid). Combining twenty studies from nine countries, Harris and Barraclough (1998) found an all cause of death risk 1.6 times that expected and a mortality risk for suicide nine times higher in schizophrenia.

Regarding the *availability* and *acceptability* of interventions, a range of drug and psychosocial interventions of proven efficacy have been developed over the last forty years. However, variable rates of efficacy, delayed onset of action and problems associated with medication compliance (and ensuing relapse) mean that treatment rates are often sub-optimal. One estimate from the US suggests that hospital costs of readmission are as high as care for first episode cases, of which 63% is due to lack of medication response and 37% due to non-compliance (Weiden and Olfson, 1995). Psychotherapeutic responses to psychiatric disorders, on the other hand, may improve compliance, and be associated with a reduction in total costs as a result of reductions in inpatient care and decreases in work impairment (Gabbard et al, 1997).

Finally, in relation to *public concern*, a combination of ignorance, misunderstanding and fear serves to put schizophrenia in a particularly stigmatised category of public perception. Victorian asylums, the psychiatrists' couch and the madman's hallucinations remain as perennial caricatures which alarmist reports in the media only serve to reinforce. The World Psychiatric Association has recently launched an international programme to fight the stigma associated with this disorder.

3.1.2 The economic burden of schizophrenia

The chronic course and debilitating consequences of schizophrenia combine to create an illness which imposes a very considerable clinical, social and economic burden on societies throughout the world, resulting in it being a leading contributor to global and regional levels of disability and overall disease burden (Murray and Lopez, 1996). From an economic perspective, this societal burden can be couched not only in terms of a far-reaching set of needs for formal health care provision that absorb high levels of public expenditure (NHS Executive, 1996; see Figure 2.1 in previous chapter), but also in other domains of support such as housing, employment, criminal justice services and informal care (Knapp, 1997). The estimated indirect annual cost of lost production in the UK, for example, is £1.7bn, and it is the single largest disease category in terms of health service expenditure, accounting for 9% of in-patient health service expenditure (Knapp, 1997).

Other 'cost of illness' studies for schizophrenia have already been highlighted in the preceding chapter (section 2.3), most of which have adopted a prevalence-based approach for estimating the morbidity of the population in question and its need for care (e.g. Rice and Miller, 1995; Knapp, 1997; Goeree et al, 1999b). Incidence-based studies, which estimate the cost of managing an annual cohort of newly-diagnosed patients over the course of their illness, are relatively rare but have the distinction of being able to better reflect known intra-patient variations in resource use over the course of the disease (Andrews et al, 1985; Davies and Drummond, 1994; Guest and Cookson, 1999). All of these cost of illness studies demonstrate the absolute magnitude of costs associated with the disorder (0.5% to as high as 3.5% of gross national product), the high proportion of direct costs still tied up in hospital care (well over 50%) and the relative contribution of lost productivity and mortality to overall cost estimates (approximately half in many of the studies). The accumulated cost-effectiveness research regarding treatment responses to this identified burden of schizophrenia, although subject to a discernible level of uncertainty, indicates that community-based care such as assertive outreach represents a viable and cost-effective alternative to hospitalisation, that psychological approaches may offer cost-effectiveness advantages and that the newer atypical anti-psychotics produce better outcomes and lower costs compared to older drugs (Knapp et al, 1999).

3.2 Study objectives and hypotheses

As suggested at the outset of the thesis, the multiplicity of care arrangements for people with schizophrenia and other psychiatric disorders that have emerged in different countries, together with the responsibility of governments and health care agencies to ensure that resources are targeted appropriately, has led to a growing interest in comparative studies of disease burden, both within and between individual countries. To date, multi-national studies of schizophrenia have focused on establishing the prevalence of the disease and assessing outcomes cross-culturally rather than examining the relationship between inputs, processes and outcomes.

EPSILON study aims and hypotheses

The EPSILON (***E***uropean ***P***sychiatric ***S***ervices: ***I***nputs ***L***inked to ***O***utcome Domains and ***N***eeds) study is a comparative, cross-sectional study of the characteristics, needs and life qualities of people with schizophrenia in five European countries, the services they receive, and the associated costs and satisfaction levels. Thornicroft and Tansella (1999) propose the 'matrix model' as a conceptual framework for mental health service evaluation. It has two dimensions: the geographical (levels: *country, local* and *patient*) and the temporal (phases: *inputs, processes* and *outcomes*). The EPSILON study concentrates on the *local* and *patient* level and on the phases of *inputs* and *process* of care. Specific objectives of the study as a whole were:

1. To produce standardised versions of five instruments in key areas of mental health service research in five European languages (Danish, Dutch, English, Italian and Spanish) each of which was converted from the original into the other four languages:
   - Camberwell Assessment of Need (CAN; Phelan et al, 1995),
   - Client Service Receipt Inventory (CSRI; Beecham and Knapp, 1992)
   - Involvement Evaluation Questionnaire (IEQ; Schene, van Wijngaarden, 1992)
   - Lancashire Quality of Life Profile (LQoLP; Oliver et al, 1996)
   - Verona Service Satisfaction Scale (VSSS; Ruggeri and Dall'Agnola, 1993).

2. To obtain and compare, in five European centres, data about social and clinical variables in patients with schizophrenia, the mental health care they receive and its costs.

3. To test both instrument-specific and cross-instrument hypotheses (see Box 3.1 for hypotheses relating to needs, informal carer involvement, quality of life and service satisfaction; these hypotheses are not directly addressed further in this chapter, although the inter-relationship of these domains with service use and costs is considered here).

Box 3.1 EPSILON study hypotheses

Needs

- The numbers of met needs and unmet needs do not differ across the five European sites.
- Patients with more met and unmet needs have lower satisfaction with services and lower quality of life.

Informal carer involvement

- Caregiving consequences do not differ across sites.
- Caregiving consequences are mainly associated with patient characteristics like symptomatology, needs for care, service use and level of global functioning.
- Caregiving consequences are not related with mental health service structure, area sociodemographic characteristics and study site.
- Patient satisfaction with services and quality of life modulate the relationship between objective caregiving consequences and subjective distress in caregivers.

Quality of life

- Quality of life does not differ across sites.
- Illness-related variables (level of functioning, symptoms) or disease duration are not related to quality of life.
- There is no association between quality of life and service use and costs.
- There is no association between quality of life and informal carer involvement in patients living with their familes.

Service satisfaction

- Satisfaction with services does not differ across the sites, irrespective of socio-demographic characteristics and service utilization.
- In all sites, satisfaction with services is only weakly correlated with psychopathology and global functioning.
- In all sites satisfaction with services is strongly correlated with quality of life.

Aims and hypotheses relating to service utilisation and costs

The aim of the economic component of the EPSILON study was to develop and apply appropriate methods and instrumentation for the cross-cultural measurement of service utilisation and costs for people with schizophrenia, which could be used subsequently to undertake comparative economic analyses across a number of European countries. A range of hypotheses relating to economic aspects of the EPSILON study - and the focus of this chapter of the thesis - were generated, a number of which concern a series of univariate, inter-site comparisons for people with schizophrenia, the null hypothesis being that patterns, rates or levels in each of the following domains would be the same across the sites:

- Patterns of employment (paid employment, voluntary, unemployed etc.)
- Patterns of service utilisation (inpatient care, primary care contacts etc.)
- Direct costs of care (primary and secondary health care, social care etc.)

A further set of hypotheses were constructed that were focussed on the associations or inter-relationships between costs, socio-demographic characteristics, clinical symptoms and needs-related variables:

- Greater needs, worse symptom severity and longer psychiatric history are positively associated with costs.
- After standardising for symptom severity/need, higher service costs will be associated with better quality of life and greater service satisfaction.
- Associations between symptoms, QoL and service costs are the same across sites.

3.3 Method

3.3.1 Selection of study sites, cases and instrumentation

Study sites

Six partners in five centres joined forces. The teams were located in Amsterdam, Copenhagen, London (Centre for the Economics of Mental Health and Section of

Community Psychiatry, Institute of Psychiatry), Santander and Verona. The criteria used to identify study centres were similar to those employed in other European research consortia (Dowrick et al, 1998):

- experience in health services research, mental health epidemiology, development and cross-cultural adaptation of research instruments,
- access to mental health services providing care for local catchment areas,
- a national mental health service providing community mental health services,
- geographical and cultural spread across the European Union.

Case identification

A prevalence sample of people with schizophrenia in contact with mental health services in the three months preceding the start of the study was used in each site as the sampling frame, identified either from case registers (Copenhagen and Verona) or from the caseloads of specialist services. All sites had broadly sectorised mental health care delivery. Cases identified were diagnosed using the Item Group Checklist (IGC) of the Schedule for Clinical Assessment in Neuropsychiatry (SCAN; WHO, 1992a). Only patients with an ICD-10 F20 research diagnosis were included in the study. The exclusion criteria were current residence in prison, secure residential services or hostels for long-term patients, co-existing learning disability (mental retardation), primary dementia or other severe organic disorder and extended in-patient treatment episodes longer than one year. These criteria were chosen to reduce bias between sites due to case-mix variation for those in long-term institutional care, and to concentrate on those in current 'active' care by specialist mental health teams.

Instruments

The set of instruments can be subdivided into three groups:

1. Five instruments were converted for use in the five languages by: (a) accurate translation and back-translation into/from the other four languages, (b) checks of cross-cultural applicability using focus groups, and (c) assessment of instrument reliability (Schene et al, 2000; Knudsen et al, 2000). They were then used in the

second part of the study examining care for people with schizophrenia in the sites. They comprised the Camberwell Assessment of Need (CAN; Phelan et al, 1995), Client Service Receipt Inventory (CSRI; Beecham and Knapp, 1992) which became the Client Socio-demographic and Service Receipt Inventory - European Version (CSSRI-EU), Involvement Evaluation Questionnaire (IEQ; Schene and van Wijngaarden, 1992), the Lancashire Quality of Life Profile (Oliver et al, 1996) and Verona Service Satisfaction Scale (Ruggeri and Dall'Agnola, 1993).

2. Local services were described using the European Service Mapping Schedule (ESMS; Johnson et al, 1998). The Brief Psychiatric Rating Scale (BPRS 24-item version; Ventura et al, 1993), and Global Assessment of Functioning (GAF; American Psychiatric Association, 1987) were also used. They were not translated into other languages but were used or produced in English.

3. A third group includes instruments documenting the sampling process (Prevalence Cohort Data Sheet), area socio-demographic descriptors (Area Socio-demographic Data Sheet) and patients' psychiatric history (Psychiatric History Data Sheet).

3.3.2 Development of a service receipt schedule

Analytical perspective

For the purposes of mental health economics research it is desirable to measure service use and costs comprehensively, since the broad personal and social impacts of schizophrenia typically result in a need for contact with a multiplicity of service agencies including health services, social services, housing and criminal justice services (Clark et al, 1994; Knapp et al, 1999; Weisbrod et al, 1980). This comprehensive perspective is particularly important for multi-national studies, since countries have established different boundaries between health and other services, and these boundaries have been known to shift over time as a result of changes in government policy or other forces. Also, the balance of responsibilities between the public sector (state) and other agencies might similarly vary from country to country. Data collection should therefore range beyond the immediately observable health

service inputs to include other service supports, contacts with other agencies (such as housing and criminal justice) and non-service implications of mental ill-health (particularly the costs of lost employment and productivity, and the economic burden falling on family caregivers). Moreover, data should be obtained on the frequency and intensity of any service contacts to allow for examination of service patterns and accurate estimation of associated costs.

International research on service utilisation patterns, costs and other economic dimensions of mental health care is complicated by the need to reflect the contexts within which people live and receive their care. Arguably this is true of any research tool, but the problems of economic research which crosses international boundaries are especially acute when the objects of comparison are themselves heavily influenced by social, economic, political, historical and cultural structures and forces peculiar to those sites. To a greater degree than for the other instruments developed or tested in this study, therefore, we needed to ensure that the resource use instrumentation captured the core features of each of five health care and other systems covered by the study, whilst simultaneously being sufficiently standardised to permit meaningful international comparison. A core feature of the methodology was thus to balance local relevance with international generalisability.

Sources of resource utilisation and socio-economic data

The most appropriate method of data capture for economic studies is contingent on a number of factors, including the primary purpose of the study, availability of funding and the data collection methods to be used for other evaluative information in the broader study. In the context of this study, the two broad options for data collection that presented themselves were to use existing information holdings by service-providing or funding agencies, or to rely on individual informants. One of the study sites (Verona) has a psychiatric case register that contains health service utilisation data, and other sites had some electronic data (for example, secondary health care information systems in London and Copenhagen). However, none of the local 'routine information' systems was sufficiently compatible with the others to provide the basis for comparative research. Even if there had been compatibility, there would

be the question of data breadth: do extant systems keep data on *all* relevant services? Previous research has shown that schizophrenia sufferers use many diverse services (Knapp et al, 1999). Thus even if each site had computerised data, would these cover all relevant services? In the unlikely event that they *did*, there would then be the considerable challenge of merging data sets designed for different health care systems for different local management needs. Data capture via electronic information systems was therefore rejected at an early stage.

The remaining strategies for collecting these data are to ask individuals, either through interview or self-complete questionnaire. Postal or self-complete methods (including diary cards) have been used in some previous studies (Gosden et al, 1997; Mauskopf et al, 1996) but were ruled out here partly because a low response rate was feared, but mainly for the pragmatic reason that other study objectives already required face-to-face interviews, and there is a long track record of collecting service utilisation and associated data alongside clinical data (Beecham, 1995).

Three potential groups of respondents could be interviewed: case managers, family members or patients. If there is a case manager or key-worker to co-ordinate services for the patient, s/he might be a good respondent, although this would depend on the breadth of their responsibilities and knowledge (Widlak et al, 1992). Case management has been implemented in some guise in all the study sites, but the particular modes of operation and service structures that prevail in these different sites make standardised reporting of service uptake by case managers problematic. Where a patient lives with their family, another data source could be other family members (who may act as informal case managers). In some sites it transpired that a majority of the sample lived with at least one relative (72% in Santander, 50% in Verona), but elsewhere this was much less common (20% in Amsterdam and London, and only 4% in Copenhagen). Family members were interviewed for another part of the research study (to complete the IEQ; Van Wijngaarden et al, 2000), but it was felt that this was not a sufficiently widely available data source for the purposes of the description of service use and cost calculations.

The patient is the only person who would have all or most of the information on which particular services have been accessed, how often and for what duration. A potential concern, however, is that the patient may not report service utilisation accurately, either because of their clinical condition, or because they exhibit the common human failing of poor recall. It was in fact decided to ask patients for these data, but especial care was taken with instrument design to improve the likely accuracy of the information provided (for example, by providing clearly defined and identifiable categories of service or state benefits).

The comparative merits of retrospective and prospective data collection have been discussed elsewhere (Johnston et al, 1999). Prospective data collection essentially requires maintaining a diary of all service contacts, whilst retrospective collection involves occasional completion of an interview, reflecting back on services used in the previous few weeks or months. (Data collection should not be confused with design: prospective trials can of course use retrospective methods for collecting service use data.) In this study, we adopted a three-month retrospective period, which is sufficiently long to pick up the wide range of services that individuals might take up but without stretching the respondent's powers of recall (there is evidence to suggest that interviewees significantly under-report frequent events when asked to report retrospectively over a six-month period; Jobe et al, 1990).

Instrument development

It is possible to distinguish a number of stages in the development of an instrument for collecting service use and related data. The first task was to identify criteria for selection or development of an instrument. Four requirements were identified:

- It should span the domains of accommodation and living circumstances, employment and income, and service utilisation, so as to allow description of the economic and related circumstances of individual people and the service or care 'packages' that support them.
- It should record the frequency and intensity of service use, with a view to enabling the accurate calculation of service costs.

- After translation and modest adaptation it should be suitable for use in other European countries.
- It should be understandable by respondents (people with schizophrenia) and manageable for use in interviews conducted by trained researchers.

Rather than start from very first principles, it was decided to build on an existing instrument, the Client Service Receipt Inventory (CSRI). The CSRI has been widely employed and has a multitude of forms, having been used in over 100 studies since it was first developed in England in the mid 1980s. (Beecham and Knapp, 1992, introduce this instrument in the context of a wider discussion of cost research methods in mental health.) A set of baseline questions was generated which covered the topics of interest (initially in English, subsequently translated into the other four languages).

The baseline version of the Client Socio-demographic and Service Receipt Inventory - European version (CSSRI-EU) was constructed around five main sections (Box 3.2; for the full version of the instrument, see Appendix A). A manual was prepared in order to provide explanatory notes for particular questions or items in the schedule that required additional information, definition or guidance (Appendix A).

Box 3.2 Key domains and variables of the CSSRI-EU

Section	Key variables
• Socio-demography	Age, gender, marital status, ethnicity, mother tongue, years of schooling, educational level
• Usual living situation	Living situation (alone, with relatives etc.), type of accommodation, household composition
• Employment and income	Employment status, occupational category, days of work lost, state benefits, source / level of income
• Service receipt	Hospital inpatient days, outpatient / day care attendances, community-based service contacts (mental health, social services & primary care), criminal justice service contacts
• Medication profile	Name/type of drug, dosage level and frequency

Socio-demographic information: A range of categorised socio-demographic variables, including date of birth, gender, marital status, ethnic group, mother tongue, years of schooling and level of educational attainment comprised the initial section of the instrument. Although some of these variables (such as age or gender) appear in other instruments, these data were comprehensively recorded here for completeness. Moreover, such data lead naturally onto consideration of other socio-economic circumstances.

Usual living situation: Accommodation represents an important parameter for economic studies of psychiatric disorder, largely because of the high cost of specialist residential care. An individual's living situation (alone, within a family or living with other, non-related residents) is also a potentially significant predictor of cost (and outcomes). Accommodation was divided into domestic, hospital and community residential categories, each with clearly defined sub-categories (for example, tenure of domestic accommodation or staffing cover/intensity in residential care). Changes in accommodation over the retrospective period can be recorded. For all people resident in non-domestic accommodation, the completion of a one-page supplement was requested, containing information on the number of (available and occupied) places/beds in the facility, the total complement and cost of care staff, other revenue costs and the average weekly charge or fee per resident place/bed. This supplement, based on a schedule developed for costing mental health residential care in the UK (Chisholm et al, 1997c), was completed *after* the face-to-face interview, in consultation with a facility manager.

Employment and income: This section aimed to elicit information on patients' employment and income circumstances. It is an important source of information for establishing the indirect costs and effects of schizophrenia, such as lost days of work, and also for estimating the living expenses of the patient. Employment status was divided into a number of appropriate categories (paid or self employment, unemployed, housewife/husband etc.), whilst occupational categories were based on an international standard classification of occupations (manager/administrator, professional, skilled labourer etc.). The approach taken with respect to the receipt of state benefits was to identify a number of international categories of

benefits/entitlements, and to have a list of national variants that fell under these broad international categories. This met the dual requirement of making consistent comparisons between study sites whilst building up a set of data that has most meaning and use within each individual site. Personal (gross) income was also requested, using bands obtained from national statistics offices that reflected the quintiles of gross income in each country (thereby enabling comparison of proportions of patients falling into these internationally equivalent income bands).

Service receipt: A range of psychiatric, social and general medical services were identified which together were considered a comprehensive profile of services available to the patient population in each of the five centres. The main categories were: psychiatric and general medical inpatient hospital admissions and total days; psychiatric and general medical hospital outpatient attendances; community-based day services (frequency and intensity of attendance); and contacts with primary care, social services and community mental health care professionals. Clear definitions were attached to individual service components or categories in order to enhance multi-site comparability, and space was left for inclusion of other services provided to patients that were not specifically identified in the inventory. For each service, the number of contacts in the previous three months was requested, and where applicable, the sector of provision (statutory/government, voluntary or private). A final sub-section asked for information relating to contact with criminal justice services (number of police contacts, nights in custody, psychiatric assessments or court appearances).

Medication profile: A profile of the individual's use of all prescribed medications in the previous one month was requested, incorporating the name of the drug, the dosage level and frequency, and whether it was prescribed as a long-standing depot injection.

Translations and focus groups

Once the baseline version of the instrument had been developed, the next steps were translation into the other four European languages (Danish, Dutch, Italian, Spanish),

either by professional translators or local researchers, followed by cross-cultural validation of the translated instrument. Since the CSSRI-EU is an inventory of socioeconomic indicators and service variables rather than a multi-item rating scale of a particular outcome domain, the focus in this study was on achieving face validity and semantic equivalence within and between individual participating sites, rather than formal exploration of the reliability of the measure between raters, sites or time points. This took place both through informal dialogue and discussion with principal investigators and other interested parties, and more formally through the conduct of focus groups. Focus group discussions consisted of between 6-10 individuals, spanning psychiatrists, other health professionals, social care workers, informal carers and service users, and were intended to address two aspects of the instrument: its content and its language (Knudsen et al, 2000).

The CSSRI-EU focus groups generated a number of system-level comments that revolved around the perceived incompatibility of local or national health, social and welfare structures with the attempted European-wide structures or categories given in the initial version of the CSSRI-EU. These comments related to two sections of the instrument: usual living situation and employment and income. In particular, focus groups suggested reordering of categories of employment, benefit entitlements and accommodation that better reflected their own national taxonomies. These suggestions were incorporated as far as possible without losing the core requirement of inter-site comparability. For example, four international categories of state benefits were developed (unemployment/income support; sickness/disability; housing; pension), within which sites could specify local variants of these broader categories. Residential care was a further area that required reordering, owing to the heterogeneity of service arrangements in different sites. In this case, the final categories were couched in neutral, broad terms to overcome this differentiation (overnight facility, 24-hour staffed; overnight facility, staffed (not 24-hours); overnight facility, unstaffed).

A second set of comments revolved around country-specific suggestions for enhancing the understanding, definition or measurement of individual items or components included in the service receipt section of the inventory. A particular area

of discussion concerned the appropriate classification and definition of day care and community-based mental health services. For example, the Dutch system of RIAGGs (community-based mental health centres) needed to be correctly classified under the appropriate item in the inventory. The instrument was then revised, both in its original English form (in the light of focus group recommendations as to content) and in each of four translations (in the light of recommendations about terminology or language).

3.3.3 Service costing methodology

For each of the service components covered by the CSSRI-EU, unit costs were calculated in all five sites. Where possible, and following conventional practice in health economics research, short-term average costs were used as a proxy for long-run marginal costs of services (Beecham, 1995). The key categories of cost incorporated into unit cost estimates were: salaries of staff employed in the direct care and management of patients; facility operating costs where the service was provided (cleaning, catering, consumables etc.); overhead costs relating to the service (personnel, finance etc.); and capital costs of the facility (buildings and equipment). Unit cost templates were developed to assist in the calculation of these site-specific costs. In one site (Amsterdam), and for certain services in other sites, only insurance reimbursement or other price data were available as the basis for calculating unit costs. Profit motives and varying reimbursement practices mean that the use of per diems or charges may not represent a good proxy of opportunity cost. However, the social insurance system in The Netherlands, in addition to detailed economic costing of specific service components, allowed us to be confident that opportunity costs were being closely approximated. Site-specific unit costs are given in Table 3.1.

For the purposes of international comparisons of cost, a mechanism for converting national costs or prices into a common currency is required. The most obvious option is to employ official currency exchange rates. However, when a cost or price is converted to another using exchange rates, the resulting figure will reflect not only differences in the quantities of services purchased, but also differences in price level between the countries (which would distort subsequent comparisons).

Table 3.1 Unit costs

Service category	Unit of measurment	Local currencies (1996/97)					Converted currencies (UK £, PPP)			
		Amsterdam[1]	Copenhagen[2]	Santander[2]	Verona[2]	London[3]	Amsterdam	Copenhagen	Santander	Verona
		Guilder	*Kroner*	*Peseta*	*Lire*	*Pound*	*(PPP, 3.17)*	*(PPP, 12.9)*	*(PPP, 193)*	*(PPP, 2458)*
Residential care										
• Overnight facility, 24-hr staffed	Week	770	5,950	-	1,435,341	422	243	460	-	584
• Overnight facility, < 24 hr staffed	Week	445	2,352	-	235,331	215	140	182	-	96
Hospital services										
• Acute psychiatric ward	Day	355	3,015	38,939	511,579	152	112	233	202	208
• Long-stay / rehabilitation ward	Day	-	2,255	-	205,841	140	-	174	-	84
• General medical ward	Day	-	3,343	29,493	472,835	211	-	259	153	192
• Psychiatric outpatient visit	Attendance	114	395	-	115,770	91	36	31	-	47
• Emergency room	Attendance	-	516	8,470	44,683	52	-	40	44	18
• Day hospital	Attendance	214	-	11,598	214,960	57	68	-	60	87
Day care services										
• Community mental health centre	Per hour	85	207	3,597	31,439	20	27	16	19	13
• Day care centre	Session	75	-	-	157,171	41	24	-	-	64
• Sheltered workshop	Per hour	75	-	-	18,304	5	24	-	-	7.4
Community-based services										
• Primary care physician	Consultation	37	91	1,050	20,000	14	12	7.0	5.4	8.1
• Psychiatrist (community-based)	Per hour	115	546	5,340	105,720	78	36	42	28	43
• Psychologist	Per hour	115	504	4,200	71,340	62	36	39	22	29
• Social worker / case manager	Per hour	58	270	3,480	54,300	54	18	21	18	22
• Home help / care worker	Per hour	15	210	-	32,880	10	4.7	16	-	13

Note: Missing values (-) indicate that the service is not available locally or was not used by any local study participant during the period of study

1 Average tariffs/prices, inclusive of capital and overheads, based on costs research by Dutch Association of Mental Health Services (GGZ-Nederland)

2 Costs, inclusive of capital and overheads, estimated from local hospital and social welfare service accounts / finance data

3 Costs, inclusive of capital and overheads, obtained from *Unit costs of Health and Social Care* (Netten and Dennett, 1998)

Exchange rates are also subject to rapid changes, owing to the volatility of certain currencies. Another option is to construct a set of conversion factors based on a market-basket approach (Schulman et al, 1998). This approach has the benefit of being more closely tuned to the particular inflationary and other forces that characterise a particular market or sector (thus, the 'basket' could incorporate service elements specific to mental health care delivery). In the context of this study, it was decided that there were an insufficient number of services common to all five participating study sites that could be used as the basis of working out reliable adjustment factors (arguably there are also too few sites and cases).

A final option, and the one used in this study, is the use of 'purchasing power parities' or PPPs, which reflect the *relative* cost of goods in particular sites. Routinely calculated by the OECD in collaboration with the Statistical Office of the European Communities, PPPs are the rates of currency conversion which eliminate the differences in price level between countries (OECD, 1996). Thus, when the conversion is made using PPPs, it reflects only the differences in the volume of goods and services purchased. The conversion factors or PPPs for each site are tabulated below (Table 3.2). Cost of care reported here are expressed in UK £ sterling PPPs. (To convert reported cost results into an alternative currency, divide values by 0.32 (Dutch Guilders); 0.08 (Danish Kroner); 0.005 (Spanish Pesetas); 0.0004 (Italian Lire); for example, to express all costs in Dutch guilder PPPs, divide national costs by 4.08 (COP), 0.32 (LON), 60.8 (SAN) and 776 (VER)).

Table 3.2 Purchasing power parities used in EPSILON study (OECD, 1996)

	AMS	COP	LON	SAN	VER
AMS	1.00	4.08	0.32	60.8	776
COP	0.24	1.00	0.08	14.9	190
LON	3.17	12.9	1.00	193	2458
SAN	0.016	0.067	0.005	1.00	12.77
VER	0.0013	0.0053	0.0004	0.0783	1.00

3.3.4 Statistical analysis

Categorisation of resource utilisation and service cost data

For the purposes of comparative analyses, service utilisation items in the CSSRI-EU were aggregated into a number of categories, so that data could be usefully summarised (but without unduly obscuring potential variations): hospital inpatient days (psychiatric and general medical care wards); hospital outpatient visits (psychiatric, general medical and emergency departments); day care attendances (including day hospital, community mental health centre, day centre, drop-in centre and sheltered workshop); community-based contacts (including primary care doctor, practice nurse, social worker, community-based psychiatrist, psychologist, community psychiatric nurse and home care worker); and residential care days (overnight hostel accommodation with permanent, regular or *ad hoc* staff cover arrangements). The five components represent functional (rather than organisational) components of the services participating in the study.

Univariate analyses

The chi-square test statistic was used for testing inter-site categorical and proportional differences. For socio-demographic variables, adjusted standardised residuals of +/- 3 (categorical data) are reported to illustrate the more extreme relative contribution(s) of cells to the test statistic. Owing to the skewed distribution of mean service utilisation and associated cost variables, confidence limits and F statistic probability values for inter-site comparisons were obtained by a non-parametric bootstrap (Efron and Tibshirani, 1993). Bootstrapping employs large numbers of repetitive computations (in this study, 500) to estimate the shape of a statistic's sampling distribution, thereby avoiding the strong distributional assumptions of parametric estimation. In order to address hypothesised site-level socio-demographic and clinical differences, analysis of raw service use and costs scores was followed by estimation and testing of adjusted means or proportions (factors adjusted for in the OLS regression were study centre, gender, marital status and employment; covariates adjusted for were age, education, GAF and BPRS score).

Multivariate analyses

The multivariate analytical strategy had three stages. First, a preliminary analysis was performed of the relationship between cost and key socio-demographic and clinical characteristics in each of the participating sites. This used multivariate ordinary least squares (OLS) methods on (untransformed) cost data, and was aimed at identifying those explanatory factors which were likely to be worth considering in subsequent analyses. In the second stage, a more detailed analysis was performed by site, in order to identify models which would be both more parsimonious and also more appropriate in terms of statistical assumptions. Forward stepwise regression was used to identify reduced models. The third stage involved fitting a global model to the combined data set, in order to identify any strong relationships which would hold across sites. In order to illustrate the differences obtained under various assumptions, results from different types of model are given, and conclusions are based on those findings which are relatively robust.

In each of these models, the dependent variable of interest was the mean annual service cost (or its natural logarithm), expressed in UK £ PPPs. The independent variables introduced into the analyses were as follows (those asterisked are indicator or 0-1 variables): age, education level attained, gender*, marital status*, ethnic group*, language*, living situation*, accommodation type*, employment status*, total number of psychiatric admissions, years of contact with psychiatric services, GAF score, BPRS mean score, number of met and unmet needs, average global well-being and average quality of life score (from LQoLP), global and average satisfaction scores (from VSSS). Ethnic group and language were not included in the Santander or Verona analyses as there were no non-indigenous people in these samples.

In stage one, using OLS regression on the raw data, sampling distributions of coefficients were estimated using bootstrapping (Efron and Tibishirani, 1993). Where the percentile-based 95% confidence intervals excluded zero when estimated in this way, they were judged to be non-significant at $p=0.05$. Significance was also assessed using parametric methods for comparison. The robustness of the OLS models was investigated using Kolmogorov-Smirnov tests for the normality of the

residuals, and visual examination of plots of the residuals against the independent variables. Comparison between the two log-based models was made on the basis of root mean squared and mean absolute errors, and published recommendations.

The non-normal residual errors for certain site-specific OLS regressions on raw data led to the need for a set of models in stage two that satisfied distributional assumptions (as well as homoscedasticity and independence). Transformation of cost onto a logarithmic scale is one method for addressing the related problems of skewness, outliers and heteroscedasticity (Diehr et al, 1999). In addition to OLS regressions, therefore, site-specific log-transformed models were derived for stage 2. As an alternative, GLMs (generalised linear models) with a gamma distribution and a log-link function, which incorporates the logarithmic scale through a link function but fits expected values to data on the raw scale, assuming that the errors have a gamma (long-tailed) distribution (Diehr et al, 1999).

In stage 3, hypotheses 1 and 2 were tested on a global level (pooled across sites) using the same strategy as in the site-specific modelling was employed: OLS estimation on untransformed and log-transformed cost data, followed by the log-gamma GLM. Dummy variables for sites were entered into these model, and tests of interaction between site and the other covariates were performed, using the final preferred model (OLS log-normal), in order to assess the evidence for inter-site differences in the direction and magnitude of effects. Since there was evidence for heteroscedasticity in the log-normal residuals at site level, a non-parametric correction factor ('Duan smearing') was applied to the exponentiated site coefficients in the global log-normal model (Manning, 1998). This allowed direct comparison with the coefficients of the GLM model.

Sample size considerations were focused on the reliability component of the EPSILON study, resulting in tests of differences for disaggregated service costs (for example, day care) that are subject to power constraints. Non-significant differences for these disaggregated service elements and costs therefore need to be interpreted in the light of these likely power constraints.

3.4 Results

3.4.1 Description of sites and service systems

Amsterdam: Data were collected in Amsterdam South East which is a 30-year old borough and a mainly residential area for a middle class population. It has a total population of 110,000 of which about 50% are from one of the 60 minority ethnic groups. The mental health services in Amsterdam South-East are in the process of change and integration. The former psychiatric hospital Santpoort (20 miles from city centre) only recently started to deliver services integrated with local area services. Outpatient services are now available from the Regional Institute for Ambulatory Mental Health Care, the outpatient department of the Academic Medical Centre and the outpatient department of Santpoort. These three services are being integrated into a multi-site Social Psychiatric Service Center. Other services available for patients with schizophrenia are non-hospital residential services, home care, two shelters for homeless people with psychiatirc disorders, a day care centre and vocational rehabilitation services.

Copenhagen: The city of Copenhagen has a total population of 483,700 and is divided into 14 districts (boroughs). The two districts of Vesterbro and Kongens Enghave, where the study was performed, are neighbouring districts with a total population of about 48,000. Comprehensive mental health services in Vesterbro and Kongens Enghave are provided by Hvidovre Hospital. A liaison psychiatric service is provided to the general hospital. In addition, Hvidovre hospital has three community mental health centres. Vesterbro Community Mental Health Centre mainly provides services for people with chronic illnesses living in Vesterbro and Kongens Enghave. A multidisciplinary team provides outpatient care, structured daytime activities (social training, arts, cooking, sports, psychoeducation), and home visits to patients. There is close collaboration between the community mental health centres and other health services (GPs, social care and residential services, voluntary organisation etc.).

London (Croydon): Croydon is predominantly a suburban borough in south London with a total population of 330,000. The population ranges from a somewhat deprived

area in the north of the borough to a more affluent, middle class and semi-rural southern area. In this study, patients were recruited from a catchment area of about 67,000 people. Specialist mental health services in Croydon are purchased by Croydon Health Authority and provided by the Bethlem & Maudsley NHS Trust. For the provision of community mental health services the borough is divided into three localities, each serving a population of about 100,000. There are four community mental health centres for the whole borough of Croydon. These function as community multidisciplinary team bases, settings for out-patient and depot medication clinics, and as day-centres providing occupational therapy and psychotherapeutic groups. Social Services and the private and voluntary sectors also provide day-care places, work opportunities and 'pop-in' services.

Santander: The study was conducted in Santander, the capital of Cantabria, an Autonomic Community with a population of about 560,000 inhabitants in northern Spain. The city of Santander is a University town, predominantly middle class, with a total population of about 194,000 inhabitants. Psychiatric services in Santander are provided by the Spanish National Institute of Health, Autonomic Health Administrations, and non-profit religious organisations. The main services are an acute psychiatric in-patient unit provided by the University Department of Psychiatry at a large teaching hospital, a 24-hour acute emergency unit at the same hospital, two multidisciplinary adult mental health teams, and, for long term psychiatric care, some patients are referred to two long-stay psychiatric hospitals (from which only patients with stays shorter than one year were recruited). The majority of patients with schizophrenia receive care from public mental health services.

Verona: Data were collected in the South-Verona community mental health service. South-Verona is a predominantly urban area with a mainly middle class population of about 70,000. The South-Verona community mental health service from which patients were recruited has developed gradually over the last 20 years, and it is the main psychiatric service providing care to South-Verona residents. It supplies a wide range of well-integrated hospital and community services, including in-patient and day care, rehabilitation, out-patient care and home visits, as well as a 24-hour emergency service and residential facilities for long-term patients. With the

exception of hospital nurses, all staff (psychiatrists, psychologists, social workers, community nurses) work both inside and outside hospital. The vast majority of patients with a diagnosis of schizophrenia are on the caseloads of public mental health services.

Table 3.3 gives details of the populations and socio-demographic descriptors of the study sites; unemployment rates varied from 7% in London to 16% in Amsterdam. There were also substantial differences in service organisation, including the availability of residential services in the study sites. In particular, the provision of both non-acute hospital and non-acute non-hospital (residential) places in Copenhagen far exceeds numbers in the other sites, with substantial variation in the number of non-acute hospital beds across the remaining sites and almost a complete absence of non-acute non-hospital residential places in Cantabria. These differences in service availability are discussed further with respect to individual-level uptake of services in the concludng section of this chapter.

Table 3.3 Socio-demographic characteristics and residential services (per 100,000 adult population) in five European study sites

	Amst'dam	Cop'hagen	London	Cantabria (Santander)	Verona
Socio-demography					
Area population (18-64)	73,454	36,581	41,636	323,851	50,455
Female* (%)	50	48	52	50	49
Married+ (%)	37	25	29	61	64
Unemployed* (%)	16	14	7	12	7
Inhabitants living in single-parent families++ (%)	15	6	2	10	9
Residential places per 100k					
Secure hospital places (a)	-	7	6	1	-
Acute hospital places (b)	59	125	28	13	29
Acute non-hospital places (c)	-	-	1	-	2
Non-acute hospital places (d)	58	73	9	75	23
Non-acute non-hospital (residential) places (e)	79	176	74	4	52
Total residential places	196	381	118	93	106

* denominator: population aged 18-64 years; + population aged 18-99 years; ++ population aged 0-99

3.4.2 Key socio-demographic characteristics of the sampled populations

A total of 404 subjects across the five participating sites were recruited into the study (Table 3.4). There was a higher proportion of men than women in all sites (typically a ratio of 60:40), except in Verona where the proportions were similar. Approximately two-thirds of study members were single (range 58-72%), and no more than a quarter were married (range 10-24%). The mean age of subjects was 42 years (SD 11), of which an average of 10.4 years (SD 2.7) had been spent in general education. Sites differed significantly with respect to the ethnic composition of the sampled populations, with a large percentage in Amsterdam (46%) and London (35%) perceiving their ethnic identity to be other than white European, compared to less than 10% in Copenhagen and 0% in Santander and Verona. There is also a clear distinction between the sites with regard to the living situation of the subjects, ranging from Santander and Verona, where over 90% of subjects live in domestic accommodation (mainly with their relatives), to the other sites where the proportion residing in domestic accommodation was between 70-80%, mainly living alone (42-65%).

The proportion of subjects who were students or in open employment was low (5% in London, 15-23% elsewhere), whilst a further 1-8% were in sheltered employment. The majority of subjects were long-term unemployed or pensioned, and in receipt of some form of state benefits (except in Verona, where only 35% were receiving financial support from the state). This finding is borne out by the relatively higher number of subjects in this site for whom their main source of income is from wages (23%), family (29%) or other (23%). Many patients in Santander are also primarily supported financially by their relatives (40%). In the other three sites, 85-98% of subjects viewed state benefits as their primary source of income.

In terms of clinical characteristics, there was a statistically significant inter-site difference in symptom severity as measured by the Brief Psychiatric Rating Scale (range 1.47 to 1.67; ANOVA test: $p=0.047$), but no appreciable difference in the Global Assessment of Functioning (range 56.48 to 58.97; $p=0.273$).

Table 3.4 Comparison of key socio-demographic and clinical characteristics

Variable		AMS (N=61) %	COP (N=52) %	LON (N=84) %	SAN (N=100) %	VER (N=107) %	ALL SITES (N=404) %	*p value*
Gender	Male	67.2	59.6	58.3	59.0	48.6	57.4	
	Female	32.8	40.4	41.7	41.0	51.4	42.6	0.197
Marital status	Single	72.1	59.6	64.3	71.0	57.9	64.9	
	Married	9.8	11.5	15.5	16.0	24.3	16.6	
	Other	18.0	28.8	20.2	13.0	17.8	18.6	0.102
Ethnicity	White	*54.1*	92.3	*65.5*	**100.0**	**100.0**	84.9	
	Other	**45.9**	7.7	**34.5**	*0.0*	*0.0*	15.1	<0.001
Language	National	*78.7*	88.5	92.9	98.0	**100.0**	93.3	
	Other	**21.3**	11.5	7.1	2.0	*0.0*	6.7	<0.001
Living situation	Alone	**49.2**	**65.4**	41.7	*7.0*	*15.0*	30.2	
	With partner	8.2	11.5	16.7	17.0	25.2	17.1	
	With relatives	*19.7*	*3.8*	*20.2*	**72.0**	49.5	38.6	
	With others	23.0	19.2	21.4	*4.0*	10.3	14.1	<0.001
Accommodation	Domestic	*70.5*	80.8	79.8	**100.0**	91.6	86.6	
	Community	**27.9**	15.4	13.1	*0.0*	7.5	10.9	
	Other	1.6	3.8	**7.2**	0.0	0.9	2.4	<0.001
Occupation								
	Employed / student	18.0	15.4	*4.8*	20.0	23.4	16.8	
	Sheltered work	8.2	3.8	1.2	2.0	4.7	3.7	
	Unemployed/pension	57.4	80.8	**91.7**	65.0	*57.9*	69.6	
	Housewife/husband	16.4	0.0	2.4	13.0	14.0	9.9	<0.001
State benefits	Yes	**93.4**	**100.0**	**91.7**	74.0	*35.5*	73.8	
	No	*6.6*	*0.0*	*8.3*	26.0	**64.5**	26.2	<0.001
Income source	Salary/wage	11.5	2.1	*2.4*	13.3	**23.1**	11.9	
	Benefits	**85.2**	**97.9**	**89.3**	*46.9*	*25.0*	62.2	
	Family	*3.3*	*0.0*	*7.1*	**39.8**	28.8	19.5	
	Other	0.0	0.0	1.2	0.0	**23.1**	6.3	<0.001
		Mean (SD)	*Mean (SD)*	*Mean (SD)*	*Mean (SD)*	*Mean (SD)*	*Mean (SD)*	*P value (ANOVA)*
Age of respondent (years)		39.9 (9.9)	39.4 (9.6)	43.8 (12.3)	39.9 (9.3)	43.0 (12.4)	41.8 (11.1)	0.024
General education (years)		11.8 (2.2)	9.9 (2.3)	11.3 (1.5)	10.7 (2.3)	8.7 (3.2)	10.4 (2.7)	<0.001
GAF score		56.48 (11.9)	53.57 (14.3)	58.71 (11.1)	58.97 (18.8)	56.64 (16.6)	57.26 (15.3)	0.273
BPRS score		1.648 (0.47)	1.666 (0.49)	1.513 (0.43)	1.596 (0.52)	1.467 (0.46)	1.562 (0.48)	0.047

Note: Figures in **bold** - adjusted standardised residuals > 3.0; figures in *italics* > - 3.0

3.4.3 Univariate analyses of service utilisation and costs

Rates of contact with services

The proportions of patients in each site who had been in contact with a range of health and social care services in the previous three months are reported in Table 3.5. For each service category, there are sizeable and statistically significant differences in contact rates between the five sites, even after adjustment for the sociodemographic and clinical variables reported in Table 3.4 (Chi Square statistic: $p<0.05$). Adjusted values were very similar to raw observed values, and consequently are not reported here. The proportion of subjects who had had an inpatient admission across all five sites was 11.6% (95% CI = 9-15%), but this varied from 1.6% in Amsterdam (only one patient out of sixty-one sampled) to 23.1% in Copenhagen. The proportion of patients who had had at least one hospital outpatient attendance in the sites other than Verona varied between 11% and 28%. In the Verona site, the proportion was 84%, reflecting the fact that within the continuity of care model pursued in this locality, all contacts with a psychiatrist, whether in a hospital or community setting, are recorded as outpatient visits. This high proportion pushes the overall pooled proportion up to 36.9% (95% CI = 32-42%)

The mean contact rate for day care support was 52% for the four sites other than Santander (where no day care services are available), but this disguises the very high rate of contact with such services in the Copenhagen site (92%). Community-based contacts, which included primary health care and social care as well as community mental health workers, varied between 44% (Copenhagen) and 99% (Santander), with an overall pooled proportion of 78% (95% CI = 73-82%). Finally, the proportion of patients who had been in residential care for at least some of the preceding three months was on average 14.5% (95 CI% = 11-19%). This excludes Santander, where residential care arrangements are not present. There were considerable differences between sites, for example 28% of Amsterdam patients had received some level of residential care, compared to 7.5% in Verona.

Table 3.5 Rates of service contact for people with schizophrenia in five European countries

Service contact rate (in previous 3 months)	Amsterdam (N=61)		Copenhagen (N=52)		London (N=84)		Santander (N=100)		Verona (N=107)		ALL SITES[1] (N=404)		
	N	% (95%CI)	N	% (95%CI)	N	% (95%CI)	N	% (95%CI)	N	% (95%CI)	N	% (95%CI)	p value (χ^2)
Hospital inpatient days	1	1.6 (0.2-0.7)	12	23.1 (14-36)	14	16.7 (10-26)	9	9.0 (4.7-16)	11	10.3 (5.7-18)	47	11.6 (8.7-15)	0.004
Hospital outpatient visits	17	27.9 (18-40)	8	15.4 (7.8-28)	23	27.4 (19-38)	11	11.0 (6.2-19)	90	84.1 (76-90)	149	36.9 (32-42)	<0.001
Day care attendances	24	39.3 (28-52)	48	92.3 (81-97)	40	47.6 (37-58)	-	-	47	43.9 (35-53)	159	52.3 (47-58)	<0.001
Community-based contacts	54	88.5 (78-94)	23	44.2 (31-58)	82	97.6 (91-99)	99	99.0 (93-100)	56	52.3 (43-62)	314	77.7 (73-82)	<0.001
Residential care days	17	27.9 (18-40)	8	15.4 (7.9-28)	11	13.1 (7.4-22)	-	-	8	7.5 (3.8-14)	44	14.5 (11-19)	0.004

[1] Pooled proportion and Chi-square test for day care and residential care excludes Santander site, where these services are not present (adjusted total sample =304).

Table 3.6 Service utilisation for people with schizophrenia in five European countries

Service contacts (in previous 3 months)		Amsterdam (N=61) Mean	95% CI[1]	Copenhagen (N=52) Mean	95% CI[1]	London (N=84) Mean	95% CI[1]	Santander (N=100) Mean	95% CI[1]	Verona (N=107) Mean	95% CI[1]	ALL SITES (N=404) Mean[2]	95% CI[1]	p (F statistic)[1,2]
Hospital inpatient days	Raw	1.48	0.0-5.0	8.54	3.2-15.0	5.44	2.3-9.7	1.48	0.4-2.7	3.07	1.0-5.8	3.63	2.4-5.0	0.056
	Adj.[3]	1.29	0.0:6.4	6.46	1.1:13.0	5.77	1.9:10.5	1.42	0:3.4	3.25	0.7:6.5			0.046
Hospital outpatient visits	Raw	1.97	0.7-3.5	2.21	0.2-6.5	0.54	0.3-0.9	0.11	0.1-0.2	4.90	3.9-5.9	2.02	1.5-2.8	<0.001
	Adj.[3]	1.58	0.7:2.6	2.42	0.0:7.1	0.46	0:1.1	0.08	0:0.3	4.92	3.9:6.1			<0.001
Day care attendances	Raw	13.51	8.2-18.9	18.42	12.8-25.2	5.83	3.4-9.0	-	-	15.37	9.1-21.5	12.88	10.1-15.7	0.014
	Adj.[3]	16.03	9.5:22.7	15.94	10.0:24.7	7.17	3.7:11.3	-	-	15.44	8.8:22.0			0.006
Community-based contacts	Raw	9.85	6.2-13.6	6.19	2.9-10.5	9.76	7.9-12.3	4.66	4.1-5.3	9.41	5.5-13.7	7.96	6.5-9.5	0.090
	Adj.[3]	11.09	6.8:16.4	4.98	1.4:9.4	9.55	7.6:12.1	4.93	3.7:6.4	9.73	4.6:14.1			0.004
Residential care days	Raw	25.08	15.6-36.0	13.85	5.5-23.6	11.60	5.2-17.3	-	-	6.73	2.7-11.5	12.97	9.4-16.5	0.014
	Adj.[3]	26.97	17.5:38.5	9.79	1.9:23.3	13.12	6.8:22.6	-	-	6.25	1.4:12.5			<0.001

[1] Confidence limits and p values obtained by non-parametric bootstrapping (500 repetitions); lower limits set to zero where these became negative (after adjustment by linear OLS)
[2] Pooled mean and test of inter-site difference for day care and residential care excludes Santander, where these services are not present (sample = 304);
pooled means including Santander: day care = 9.69 (7.4-11.8); residential care = 9.76 (7.1-12.4)
[3] Adjusted means: adjusted for centre, gender, marital status, ethnicity, language, employment (factors); age, education, GAF, BPRS (covariates)

Table 3.7 Service costs for people with schizophrenia in five European countries

Service costs (£ per annum, 1998)[1]		Amsterdam (N=61) Mean	Amsterdam (N=61) 95% CI[2]	Copenhagen (N=52) Mean	Copenhagen (N=52) 95% CI[2]	London (N=84) Mean	London (N=84) 95% CI[2]	Santander (N=100) Mean	Santander (N=100) 95% CI[2]	Verona (N=107) Mean	Verona (N=107) 95% CI[2]	ALL SITES (N=404) Mean[3]	ALL SITES (N=404) 95% CI[2]	ALL SITES (N=404) p(F statistic)[2,3]
Hospital inpatient care	Raw	661	0-2160	7653	2822-14131	3431	1327-5925	1401	400-2520	2546	741-4437	2819	1819-3865	0.040
	Adj.[4]	320	0:2614	5772	1442:10588	3659	1217:6753	1456	129:2861	2705	933:5268			0.090
Hospital outpatient care	Raw	289	121-536	338	15-984	150	77-245	5.4	1-11	624	512-745	285	210-384	0.028
	Adj.[4]	236	107:383	376	-8:1020	139	26:177	0	0:37	627	481:771			0.004
Day care	Raw	1750	932-2470	1232	822-1688	891	352-1446	-	-	1704	840-2831	1408	1014-1802	0.246
	Adj.[4]	2293	1443:3068	774	402:1432	1091	415:1879	-	-	1650	738:2589			0.012
Community-based care	Raw	438	247-741	389	179-664	919	589-1277	153	119-202	589	293-1029	501	387-645	0.002
	Adj.[4]	551	211:947	241	1:478	1086	722:1520	90	0:195	459	130:876			<0.001
Residential care	Raw	639	367-939	322	103-561	680	334-1075	-	-	357	116-672	497	337-657	0.200
	Adj.[4]	764	510:1092	130	0:446	749	372:1276	-	-	298	30:642			<0.001
Total cost of care	Raw	3778	2580-5589	9934	4839-16093	6071	3762-8785	1558	647-2793	5819	3751-8340	5038	3888-6237	0.006
	Adj.[4]	4112	2063:6452	7460	2542:12857	6771	4231:10155	1444	279:2878	5730	3707:8160			0.016

[1] National costs of care have been converted into UK £ sterling, using 1996 purchasing power parities (OECD, 1996)
[2] Confidence limits and p values obtained by non-parametric bootstrapping (500 repetitions); lower limits set to zero where these became negative (after adjustment by linear OLS)
[3] Pooled mean and inter-site tests of difference for day care and residential care excludes Santander site, where these services are not present (sample = 304); pooled means including Santander: day care = £1059 (757-1362); residential care = £374 (252-496)
[4] Adjusted for centre, gender, marital status, ethnicity, language, employment (factors); age, education, GAF, BPRS (covariates)

Quantities of services used

Table 3.6 reports (raw and adjusted) mean receipt of services for the *total* sampled population (not just those patients who actually used services). It is apparent from Table 3.5 that rates of contact with certain categories of service are modest, leading to seemingly low (and uncertain) estimates of service receipt. However, it is the mean service utilisation for a total population (rather than the sub-population of users) that has most relevance to mental health policy and planning.

The unadjusted mean number of occupied hospital inpatient days in the previous three month period was 3.63 (95% CI = 2.4-5.0), ranging from 1.48 days in Amsterdam and Santander to 8.54 days in Copenhagen (bootstrapped F test statistic: p=0.056). Adjustment for key sociodemographic and clinical variables produced an appreciably lower value for Copenhagen (6.46 days); the inter-site test for difference is similar (p=0.046). Hospital outpatient visits were highest in Verona (a mean of 4.9 visits in the previous three months, for the reasons given above), and in the other sites ranged between an average of 0.5 and 2.2 attendances. Adjustment of raw scores had no appreciable impact on these findings, which demonstrate a highly significant inter-site difference due to the higher Verona values (p<0.001).

The overall mean number of day care attendances in the four sites where these services exist was 12.9 (95% CI 10.1-15.7). After standardisation, mean day care attendance levels are lower in Copenhagen (15.9 as opposed to 18.4 attendances), and higher in the other three sites where day care services exist. Both raw and adjusted tests of inter-site differences are statistically significant at p=0.05. For the sample as a whole, there was a mean of 8.0 community-based contacts (95% CI 6.5-9.5), unadjusted values ranging between 4.7 in Santander and 9.8 in Amsterdam (bootstrapped F test: p=0.090). Following standardisation, the inter-site test of difference returns a significant result at the p<0.05 level, with marked changes in Amsterdam and Copenhagen. There are also statistically significant differences in the mean number of days spent in residential care (p<0.05), ranging from 6.7 days for Verona residents and 25 days for Amsterdam residents (pooled mean = 9.8 days, 95% CI 7.1-12.4).

Service costs

Levels of service uptake were converted into UK £ PPPs to give an estimate of the yearly cost implications of existing patterns of provision (Table 3.7). For certain service categories, the cost results closely reflect service use comparisons. For example, following adjustment of the mean annual cost of inpatient care (pooled mean = £2819, 95% CI £1819-3865), the inter-site difference apparent before standardisation is no longer statistically significant at the $p<0.05$ level ($p=0.090$), largely as a result of correcting for the relatively less severe caseload in Copenhagen (adjusted mean = £5772, a reduction of £1881). There are also significant differences between sites in the (raw and adjusted) mean cost of hospital outpatient care (overall mean = £285, 95% CI £210-384; range £5.40 - £624; $p<0.05$).

For other service categories, the process of costing leads to different findings. An example of this relates to residential care (pooled mean = £497 p.a., 95% CI £337-657), differences in the cost of which are not statistically significant at the 5% level before adjustment ($p=0.200$). By comparison, non-monetised quantification of residential care days showed a statistically important difference (Table 3.6). Day care support represents a significant proportion of overall cost in the four sites where such services are available (mean = £1408, 95% CI £1014-1802; range £891-1750; 12-46% of total unadjusted costs). Again differences in cost, although quite large, are not statistically significant before adjustment ($p=0.246$). After standardisation, however, bootstrapped F statistics for day care and residential care show significant differences. Comparison of community-based care contacts, by contrast, reveals significant cost differences (adjusted means vary between £90 in Santander and £1086 in London; $p<0.01$). An obvious factor in the interpretation of these tests of differences relates to power (see section 3.5)

The total annual cost per patient for the combined sample is an estimated £5038 (95% CI £3888-6237). Unadjusted means are £3778 (Amsterdam), £9934 (Copenhagen), £6071 (London), £1558 (Santander) and £5819 (Verona). Cost comparisons between sites, using adjusted means as the appropriate measure, reveals statistically significant differences ($p=0.005$), ranging between £1444-7460.

3.4.4 Multivariate analyses of service costs

Model performance

The initial OLS regressions, by site, introduced all of the independent variables noted earlier, covering socio-demographic characteristics, service history, needs and clinical circumstances (Table 3.8). The overall goodness-of-fit (shown by the R^2 and adjusted R^2 statistics) is quite reasonable for a cross-sectional analysis, and a number of regressors proved significant. Non-parametric bootstrap and parametric analyses showed slightly different patterns of significance. The equations estimated for Amsterdam, Copenhagen and London satisfied the requirement of normally distributed residuals, but those for Santander and Verona did not.

Because of this potential specification problem in our first stage analyses, and to build parsimonious models, site-specific equations were re-estimated, firstly by analysing logarithm of cost using OLS, and secondly by fitting the log-gamma generalised linear model (Table 3.9). Only variables reaching or close to significance at the 5% level were included. The overall goodness-of-fit for these reduced site-specific equations is again reasonable, with R^2 values ranging from 0.118 (Verona) to 0.367 (Amsterdam) for the OLS log-normal model. Since there was no evidence of heteroskedasticity in these site-specific analyses, it is possible to use the exponentiated coefficients (Exp (β)) to interpret the links between personal characteristics and costs in terms of multiplicative factors (see below).

In the pooled, cross-site analyses (Table 3.10) the OLS model on the untransformed costs was not satisfactory: the Kolmogorov-Smirnov test statistic was 4.85 ($p<0.001$), indicating that residuals are *not* normally distributed, which could lead to biased estimates. Log-transforming the dependent variable overcame this problem (Kolmogorov-Smirnov statistic = 0.888, $p=0.409$). A log-gamma GLM was also fitted. Diagnostic tests were quite satisfactory for the log-normal model, except that kurtosis in the residuals for certain models was high (>3); there was also slight evidence of heteroscedasticity by site.

Table 3.8 OLS linear regression analyses of costs for people with schizophrenia in five European countries, by site

Dependent variable = Total annual service cost (incl. residential care), expressed in £UK PPP, 1998

Variable	Site				
	AMS (N=57) β	COP (N=43) β	LON (N=80) β	SAN (N=100) β	VER (N=93) β
Age (years)	-150	503	66	***-169***	-12
Education (years)	-9.5	596	-390	-144	-574
Gender (0 = female; 1 = male)	-2248	***-21948***	2993	828	1972
Marital status (0 = single; 1 = married/other)	-1420	182	-2026	1604	-4043
Ethnicity (0 = white European; 1 = other)	-3431	-2204	584	-	-
Language (0 = national; 1 = other)	1383	*24509*	-6446	-	-
Living situation (1 = with others; 0 = alone;)	1692	*15940*	***9595***	1130	*-7649*
Employment (0 = employed; 1 = other)	**4642**	3635	2579	-1207	-263
Psychiatric admissions	123	-445	115	***880***	201
GAF score	89	-514	-118	-3.9	97
BPRS mean score	*7339*	-4702	-1775	39	-2244
CAN met needs score	-237	616	***2488***	-467	917
CAN unmet needs score	-1004	-1395	-604	*914*	*2037*
LQoLP mean score	-1167	4974	**-5178**	807	603
VSSS mean score	-2199	-14826	-4077	*-2385*	-745
R^2	0.390	0.422	0.467	0.296	0.250
Adjusted R^2	0.167	0.101	0.342	0.179	0.125
F statistic (df)	1.75 (15,41)	1.32 (15,27)	3.74 (15,64)	2.53 (13,86)	2.00 (13,79)
P value for F statistic	0.079	0.259	<0.001	0.005	0.032
P value for K-Smirnov test (residuals)	0.115	0.775	0.563	0.001	<0.001

[1] Coefficients in *italics* are significant at p<0.05 (95% CIs estimated parametrically);
Coefficients in **bold** are significant at p<0.05 (bootstrapped 95% CIs estimated, 1000 repetitions).
Coefficients in ***bold italics*** are significant at p<0.05 under both estimation approaches.

Table 3.9 Reduced log-normal and GLM models for people with schizophrenia in five European countries, by site

Dependent variables: Log of total annual service cost (OLS); Total annual service cost (GLM)

Site-specific independent variables	OLS log-normal model β	OLS log-normal model Exp (β)	GLM (log-gamma) model β	GLM (log-gamma) model Exp (β)
Amsterdam				
Ethnicity (1 = not white European)	**- 1.075**	0.341	**- 0.695**	0.499
Employment status (1 = not employed)	**1.823**	6.194	**1.377**	3.965
Living situation (1 = live with others)	**1.063**	2.896	**0.691**	1.997
BPRS mean score	**0.778**	2.178	**0.951**	2.588
Copenhagen				
Living situation (1 = live with others)	**1.256**	3.510	1.121	3.067
GAF mean score	**- 0.067**	0.936	**- 0.065**	0.936
London				
Language (1 = not national)	**- 1.384**	0.250	**- 2.173**	0.114
Previous psychiatric admissions (total)	-0.035	1.035	**0.075**	1.078
CAN met needs mean score	**0.442**	1.556	**0.372**	1.451
Santander				
Age	**- 0.034**	0.966	-	-
Previous psychiatric admissions (total)	**0.236**	1.266	**0.321**	1.378
GAF mean score	-	-	**- 0.417**	0.659
CAN unmet needs mean score	**0.229**	1.322	-	-
Verona				
Gender (1 = male)	0.236	1.260	**0.658**	1.932
Previous psychiatric admissions (total)	0.045	1.046	**0.056**	1.058
GAF mean score	**- 0.029**	0.971	- 0.018	0.982
CAN met needs mean score	- 0.049	1.050	0.106	1.111

Diagnostics	OLS log-normal model: Fit (R^2, Adj R^2)	OLS log-normal model: K-Smirnov (p value)	OLS log-normal model: Kurtosis	OLS log-normal model: Mean sq. residuals	GLM model: Deviance per df
Amsterdam (df 4, 56)	0.367 0.321	0.75	2.23	1.98	1.68
Copenhagen (df 2, 46)	0.257 0.225	1.00	4.66	3.67	2.91
London (df 3, 78)	0.348 0.323	0.556	2.75	1.86	1.72
Santander (df 3, 95)	0.189 0.163	0.059	4.87	2.29	3.44
Verona (df 4, 95)	0.118 0.081	0.384	4.07	4.56	2.16

Note: Coefficients in **bold** are statisitically significant at $p<0.05$ (parametric estimation)

Table 3.10 Reduced OLS linear, log-normal and GLM models for people with schizophrenia in five European countries, pooled analyses

Dependent variable = Total annual service cost (incl. residential care), expressed in £UK PPP, 1998

Variable	Pooled site equations (n=385)				
	OLS model (£, PPP)	OLS log-normal model (£ log, PPP)		GLM (log-gamma) model (£, PPP)	
	β	β	Exp (β)	β	Exp (β)
Constant term	*11873*	*8.407*		12.827	
Site 2 (Copenhagen)	*4647*	- 0.022	0.978	0.734	2.083
Site 3 (London)	1279	0.108	1.114	- 0.171	0.842
Site 4 (Santander)	- 1611	***- 1.871***	***0.154***	*- 1.240*	*0.289*
Site 5 (Verona)	1945	-0.096	0.909	0.535	1.708
Gender (0 = female; 1 = male)	1122	***0.383***	***1.466***	0.341	1.407
Psychiatric admissions (total)	***284***	***0.053***	***1.055***	*0.052*	*1.053*
GAF score	**- 66**	***0.022***	***0.978***	*- 0.020*	*0.980*
CAN met needs score	*595*	***0.119***	***1.126***	0.090	1.094
VSSS mean score	**- 2234**	- 0.251	0.778	*- 1.151*	*0.316*
R^2, Adjusted R^2	0.125, 0.104	0.295, 0.278			
K-Smirnov test (p value) (standardised residuals)	4.85 <0.001)	0.888 (0.409)			
Mean squared error (£ log)		10,276		11,3331	
Mean absolute error (£ log)		- 69		644	

Notes:

1. Coefficients in *italics* are significant at $p<0.05$ (95% CIs estimated parametrically); for OLS models only, coefficients in **bold** are significant at $p<0.05$ (95% CIs estimated by a non-parametric bootstrap, 1000 repetitions) and coefficients in ***bold italics*** are significant at $p<0.05$ under both estimation approaches.

2. Tests of interaction between site and OLS log-normal model variables revealed no inter-site differences except CAN met need (F value = 3.60, p=0.007).

For the GLM model, deviance was lower but kurtosis is high. High kurtosis suggests that the log-normal OLS model is preferable to the GLM (Manning and Mullahy, 2000) and therefore, of the three models, this is preferred. The root mean squared error and the mean absolute error also slightly favour the log-normal model compared to the log-gamma GLM (if one outlying case is omitted). The log-normal OLS model was thus generally satisfactory, except for evidence of heteroscedasticity by site (P=0.001, Cook-Weisberg test). This feature partly explains the apparent discrepancy between the two models' site coefficients, since after applying Duan's smearing estimator to the OLS log-normal model, the exponentiated coefficients were much closer to the GLM model (Copenhagen = 1.892; London = 1.050; Santander = 0.250 and Verona = 1.343 - all relative to Amsterdam).

Interpretation of coefficients

The OLS log-normal model is the main focus for the interpretation of results, although the GLM results are also discussed as evidence of robustness. Inter-patient cost variations are marked, especially when looking across health care systems. It could reasonably be expected that some part of that variation would reflect inter-patient differences in clinical symptoms, needs and care history. Three composite hypotheses prompted the analyses of inter-patient cost variations in this study:

Hypothesis 1: Met and unmet needs, symptom severity and longer psychiatric history are positively associated with costs.

The evidence in support of this hypothesis is mixed. More often than not, the site-specific analyses show no significant associations between costs, on the one hand, and needs, symptoms and psychiatric history on the other. When the relationships *were* significant, they universally supported the hypothesis: higher needs, greater symptom severity and longer psychiatric history (as measured by number of previous in-patient admissions) were all associated with higher costs, other things being equal. The care systems are therefore responding in part to inter-individual differences in clinical circumstances. Using the OLS log-normal exponentiated coefficients in Table 3.9, which provide the multiplication factor attached to a unit change in the independent variable - for example, in Amsterdam costs for patients who are not

white European are about a third (0.341) of the costs of those who *are* - costs are higher or no different (but never lower) for people who are younger; who live with others; who are not employed; who have had more previous psychiatric admissions; and who have higher BPRS scores, lower GAF scores, higher CAN met needs scores or higher CAN unmet needs scores. Ethnic group and language are each relevant in one site (Amsterdam and London, respectively), but both dummy variables needed to be defined on a site-specific basis.

Hypothesis 2: After standardising for symptom severity and need, higher rates of service use are associated with better QoL / service satisfaction

Quality of life scales provide patients with the opportunity to describe their own views of their lives and (more obliquely) of the care they receive. Satisfaction with services measures directly address patients' feelings regarding their treatment and care. We found no statistically significant associations between costs and quality of life, or between cost and service satisfaction in any of the robust site-specific multivariate analyses (Table 3.9).

Hypothesis 3: Associations between symtomatology, quality of life and service costs are the same across the sites.

Not only do average costs of care vary significantly between sites, from £1,558 per annum in Santander to £9,934 in Copenhagen (Table 3.7), but also there are quite marked differences between the five European sites in the patterns of association (Tables 3.9-3.10). Using the log-normal model fitted t the pooled site data, and controlling for site, costs are significantly associated with: gender (male patients are 47% more costly than female); previous psychiatric hospital admissions (5% higher per additional admission); GAF total score (ten points higher is associated with a cost decrease of 15%); CAN met needs score (13% more costly per additional met need) and service satisfaction (VSSS) score (a 20% decrease in cost per unit of improved satisfaction). Only one site dummy proved significant: costs are appreciably lower in Santander (25% of the cost of the reference site, Amsterdam). Tests of interaction between site and OLS log-normal model variables revealed no inter-site differences except CAN met need (F value = 3.60, p=0.007); Amsterdam and London showed strong positive effects whereas the other sites did not.

3.5 Discussion

The inclusion of a health economics component into the EU-funded EPSILON study has enabled not only the development of a standardised instrument for the collection of service utilisation data in Europe, but also the analysis of patterns of service utilisation and associated costs for 404 people with schizophrenia receiving care and support from the services of five different health care systems.

Methodological considerations

A particular attribute of the study has been the common methodology employed for the collection, standardisation and analysis of data, which has strengthened the study's capacity to make international comparisons on a consistent basis. Whilst of increasing interest to policy-makers, international comparisons pose a number of methodological and analytical challenges, each of which needs to be satisfactorily addressed if meaningful use is to be made of such comparative data. Key issues identified and resolved over the course of carrying out the economic component of this study include:

- the identification and specification of items and categories of service that have local meaning or validity whilst also being internationally comparable;

- the application of a consistent framework and method for costing services, both for individual professionals and facilities or organisations;

- the employment of a method other than exchange rates (such as PPPs) for the transformation of national currencies into a common currency; and

- the use of adjusted or standardised values for the multinational comparison of service uptake and costs to account for underlying site-level differences in sociodemography and psychiatric morbidity.

The adoption of these methodological principles and procedures can certainly help to enhance the quality and reproducibility of results from multinational studies, but there remain significant sources of uncertainty and variability. For example, despite our best efforts to employ a consistent costing methodology, as well as standardisation of relative price differentials of the participating countries through the application of PPPs, resulting unit costs for certain services remained variable. In particular, use of average tariffs in the Dutch site result in consistently lower values than those estimated for sites with shared characteristics using an opportunity cost approach (London and Copenhagen). The high unit costs for London reflect the known (and included) increased prices of staff and capital associated with health service provision in that locality relative to the rest of the UK (Chisholm, 1997b). Although these discrepancies do not unduly effect single country analysis, they do hinder the interpretation of comparative, multinational data.

There are also issues relating to the validity and reliability of the service receipt schedule. Since the CSSRI-EU is an inventory of variables required for economic analysis rather than a multi-item rating scale, the focus in this study was on achieving face validity within and between individual participating sites, rather than formal exploration of the reliability of the measure between raters, sites or time points. The absence of such reliability measures represents a gap in our understanding of how accurate the CSSRI-EU is in recording rates of service utilisation. While significant but relatively uncommon events such as hospitalisation are readily recalled, there is concern that reporting of the frequency and intensity of contact with community-based service professionals by patients is subject to recall error (Jobe et al, 1990; Clark et al, 1994, 1996; Johnston et al, 1999).

This potential error can be examined by comparison of the values given by patients in the CSSRI-EU with an alternative data source, either another informant (an informal carer or key worker) or an administrative database. The limitations of these alternative sources of data in an international context have already been noted, specifically the incomplete knowledge of other informants and the absence of standardised, high-quality information systems across countries. Where they exist, however, well-maintained psychiatric case registers do offer one important data

source against which to assess the performance of certain elements of service receipt schedules such as the CSSRI-EU. Such an analysis did not comprise an objective of this study, but recent work in one of the sites (Verona) has recently considered these issues and showed that the agreement on overall psychiatric costs was high: the Concordance Correlation Coefficient was 0.93 for all patients and 0.97 for patients with a diagnosis of schizophrenia (Mirandola et al, 1999). At a more disaggregated level, agreement was high for hospital and residential care, but considerably lower for primary care and community-based care.

Further methodological limitations of the study included the use of a cross-sectional design, which removes our capacity to link costs to user outcomes (i.e. changes in health and welfare), and the short period over which inpatient service use data were collected also proved problematic; in common with other service categories, a retrospective period of three months was used so as to minimise recall bias (subsequently converted into annual rates and costs), but since a proportion of sampled inpatients had been discharged and not used inpatient services again at the point of being interviewed some months later, their annual use of inpatient days is underestimated (this explains the very low inpatient care rates reported for Amsterdam).

As with so many mental health economic analyses, the final key limitation of this component of the study relates to issues of sample size and power (Sturm et al, 1999; Chisholm, 2000a). The numbers of patients recruited in the participating sites were dictated by power requirements for the reliability component of the study (a minimum of 50 cases per site) and the time and resource constraints of two of the centres. Even for total aggregated costs, standard deviations are typically double that of the mean, so this inevitably casts doubt on the power of the study to detect statistically significant differences in more disaggregated components of resource utilisation and costs. In fact, many of the inter-site differences tested for did reach statistical significance at the 5% level, which indicates that there were sufficient numbers of cases to disprove the null hypothesis. Nevertheless, future multinational mental health economic studies need to be mindful of the importance of sample size if results are to be appropriately powered.

International variations in costs of care

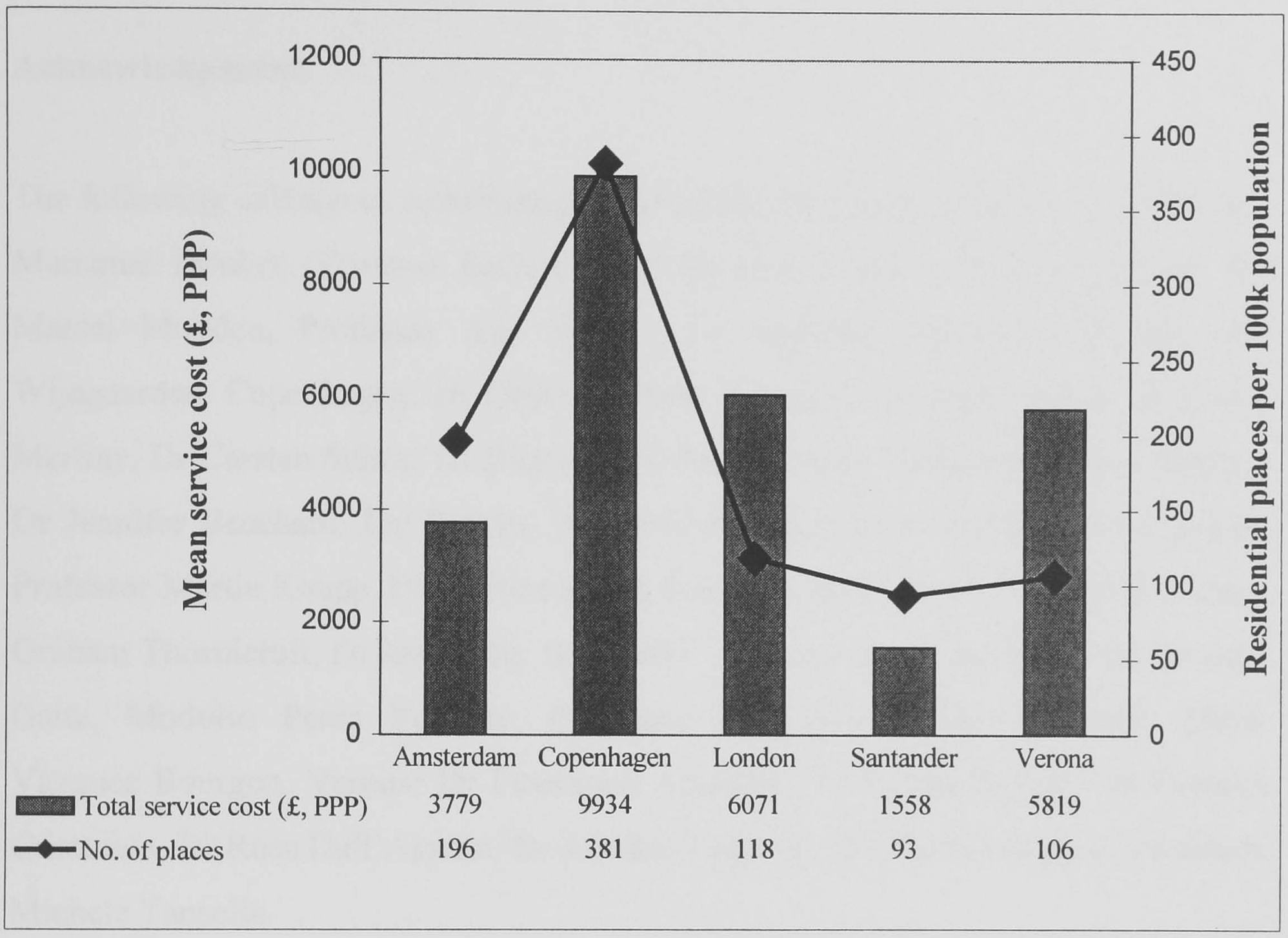
In relation to the hypotheses stated and the results obtained, the clear conclusion is that there are widespread and considerable differences between the participating sites both in the proportions of patients in contact with services and in the absolute level of service utilisation. By attaching costs to service utilisation patterns, resources employed across a number of sectors are converted into the common metric of money, which usefully highlights the considerable financial implications of providing care for people with schizophrenia. Our estimates of total average costs of care, ranging between £1,558 in Santander to £9,934 in Copenhagen, are broadly in line with previous local estimates of annual mean cost for this client group (Bonizzato et al, 2000; Evers and Ament, 1995; Haro et al, 1998; McCrone et al, 1998a). It is worth emphasising, however, that behind the estimated total annual cost per patient for the whole sample of 404 subjects (£5,038), there is not only a six-fold variation *between* sites but also a much larger variation *within* sites.

Such variations have been explored at the individual level through multivariate cost analyses, which provide an empirical baseline from which to examine differences within and across sites in the patterns of relationship in costs and their associations with individual needs, psychopathology, socio-demographic features, service history and service satisfaction. Site-specific analyses demonstrated a number of (intuitively logical) associations between costs and higher needs, greater symptom severity and longer psychiatric history (hypothesis 1), but not for quality of life or service satisfaction (hypothesis 2); these associations were broadly mirrored in pooled analyses (hypothesis 3), with the addition of the hypothesised association with service satisfaction.

There are also key site-level characteristics that have an important bearing on cost variations. The inclusion of site-dummy variables into pooled multivariate analyses provides initial evidence for this (for example, the Santander site had a significant cost-reducing impact), but the opportunity to incorporate other site-related factors into the individual-level cost data is constrained by a lack of degrees of freedom. In particular, there is a link between rates of service uptake and local levels of service

availability, support for which is given by a *post hoc* comparison between log-transformed service costs and total inpatient hospital and residential care places (Figure 3.1). For example, the fourfold difference in residential places between Copenhagen (381 per 100,000 population over 18 years) and Santander (93 places) closely mirrors the difference in service costs for these sites.

Figure 3.1 The relationship between service costs and residential places



The linked processes of individual service uptake and local service availability are in turn effected by political and economic decisions at a regional or national level, including overall levels of resources allocated to mental health services and prevailing models of social choice (Chisholm and Stewart, 1998; Thornicroft and Tansella, 1998). For example, it has been noted that by comparison with other regions of Spain, mental health service development in Cantabria has been modest (Haro et al, 1998). Such exogenous, 'supply-side' influences elude simple or consistent measurement, yet have a potentially sizeable impact on the otherwise 'demand-led' comparative assessment of individual mental health service need, uptake and cost. The analytical challenge that lies ahead, therefore, is to

satisfactorily address the complex set of inter-relationships that exist between individual needs and health-seeking behaviours, local service responses or structures, and national indicators of political position, economic wealth and cultural identity.

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4. Longitudinal investigation of depression outcomes: the LIDO study [1]

4.1 Rationale

4.1.1 The public health burden of major depression

Depression is one of the most common psychiatric disorders and constitutes a significant public health burden as a result of its high prevalence, long duration, likelihood of recurrence, under-diagnosis and inadequate treatment (Bland, 1997). An accumulating body of evidence has emerged, particularly over the last five years, which clearly demonstrates the immense burden that depression imposes upon individuals, families and whole communities throughout the world (Ustün and Sartorius, 1995; Murray and Lopez, 1996).

This 'burden' of depression has been measured from a clinical or epidemiological perspective in terms of disability effects, levels of morbidity and mortality rates. There is substantial evidence to indicate that persons with depression suffer from a number of functional limitations, including poorer physical, psychosocial and role functioning and an increased number of disability days (Sturm and Wells, 1995; Von Korff et al, 1992; Broadhead et al, 1990). It has also been estimated that 15% of all patients with a major depressive disorder die by suicide (Brent et al, 1988).

A notable attempt to capture both the mortality effects and the disabling consequences of disease was undertaken by the *Global Burden of Disease* study (Murray and Lopez, 1996), a key finding of which was that by combining the mortality and disability effects of disease into a single metric (the Disability Adjusted Life Year or DALY), the immense burden of global disease attributable to neuropsychiatric disorders became readily apparent. Major depression is estimated to the fourth largest contributor to the global burden of disease (3.7% of all causes),

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[1] The LIDO study was an ongoing prospective research investigation at the time of submission of this thesis. This was envisaged from the outset. It is included in the thesis because it was considered that there were sufficient methodological developments and interim prospective findings to be of interest and relevance in their own right. Accordingly, this chapter focuses on the development and application of the economic methods used in the LIDO study, together with a (largely descriptive) analysis of baseline and 3-month follow-up data.

and by 2020 is projected to become the single largest in developing regions, owing to high prevalence rates (particularly among women), non-detection (90% in some regions) and severity (a disability weight of 0.6 out of 1 in untreated form).

A critical issue in the management of depression is non-detection. In a recent six-country survey in Europe, nearly 60% of those with major depression received no treatment (Lepine et al, 1997). The majority of these people did not even seek treatment for their symptoms, and only a quarter received an antidepressant. High rates of non-detection were also reported in the WHO study of psychological problems in general health care (Ustün and Sartorius, 1995), while the GBD study estimated that 8.4% (out of 83 million) episodes of depression in the developing world receive treatment compared to 35% in developed regions. Increasing the rate of treatment to that currently achieved in more developed regions would therefore reduce the burden of illness due to depression in the developing world by 13%, saving 5.7 million DALYs per year. Failure to detect cases is largely attributable to misdiagnosis due to concurrence of other symptoms or somatic disorders, the physical expression of depressive symptoms (somatisation), or factors relating to the consultation process (such as clinical expertise or patient trust). This indicates that there has been a massive underestimation of the economic impact of depression.

Even when a patient has been correctly diagnosed, adequacy of treatment is not assured. Recommended dosages of antidepressants and treatment guidelines for depression are widely available but may not be heeded owing to the side-effect profiles of these medications or insufficient monitoring by practitioners of appropriate therapeutic levels and/or duration. Sub-therapeutic prescribing of anti-depressants appears to be highly prevalent, particularly for the older tricyclic antidepressants (Donaghue and Tylee, 1996). This not only has educational implications for primary care doctors, but is also likely to be associated with poorer outcomes, leading in turn to greater use of health and social care services. Patients may also interrupt their treatment, which unless the depression is naturally resolving, is likely to increase relapse and lead to higher medical resource consumption in the long term. One study concluded that a treatment failure was associated with an increase of over US $1,000 over a one-year period in medical costs (McCombs and Nichols, 1993).

4.1.2 The economic burden of depression

The burden or consequences of depression can also be usefully gauged from an economic perspective (Chisholm, 2000b). Depression imposes a range of costs on individuals, households, employers and on society as a whole (see Chapter 2, Box 2.1), the overall economic burden of which has been estimated in a series of 'cost of illness' studies which attempt to attach monetary values to these various societal costs (Table 2.1). Where a comprehensive cost estimate has been attempted, total estimated costs amount to £3.4 billion in the UK, and between $30-40 billion in the US in 1990 price levels (Kind and Sorensen, 1993; Greenberg et al, 1993; Rice and Miller, 1995). A common feature of these studies is that costs due to mortality and lost productivity constitute a very significant proportion of the total cost, due in part to the method used for calculating lost productivity, which assumes that all lost days of an adult's working life should be valued. In prevailing conditions of unemployment, this 'human capital' method represents an overestimation of true opportunity costs. In a less comprehensive but comparative cost of illness study in the UK, the NHS Executive (1996; Figure 2.1) demonstrated the *relative* magnitude of depression costs. Costs to the NHS for neurotic disorders amounted to £887 million in 1992/93, exceeded only by psychotic disorders (£1,159m) and considerably greater than, for example, diabetes (£300m) or hypertension (£439m).

The costs of *not* treating depression in the US were considered by Rupp (1995), who performed a 'what-if?' scenario to analyse the changes in costs of depression that would result from an increase of adequate treatment to 70% of all depression cases, and concluded that the direct costs of care and treatment in the US would increase by $4.2bn, but mortality and morbidity costs would each decrease by over $4.2bn, giving an overall 'saving' of $4.1bn to society.

Measurement of total depression-related costs is important because of the possibility that, in the long-run, mental health care may reduce general medical expenditures. Using data from the Medical Outcomes Study, Sturm and Wells (1995) demonstrated that although treatment for depression in the mental health specialist sector is more expensive than treatment in the general medical sector, it also leads to greater improvements in functional outcomes and represents the more cost-effective

strategy. Similarly, Zhang et al (1999) show that while the expected costs of treatment for the average patient receiving depression treatment in the mental health sector were $1,224 higher than that in the general medical sector, lost earnings were $2,101 lower (a net saving of $887 per patient per year). A review of this 'cost-offset' effect concluded that although a number of cross-sectional and quasi-experimental studies support an association between depression and medical utilisation, there are no experimental studies which clearly establish that such a cost-offset can be realised (Simon and Katzelnick, 1997).

A prevailing issue for multi-national investigations is the extent to which it is possible or sensible to pool site-specific clinical and economic data in order to make comparisons between centres or countries. While there is evidence to suggest that core concepts of depression and quality of life can transcend national boundaries (Ormel et al, 1994; WHOQOL Group, 1998), there is far less consensus on the transferability of resource utilisation or cost data, since these constructs are so heavily influenced by the historical, cultural and political circumstances of service development and provision. Previous international studies of depression have yet to fully address these issues (Dowrick et al, 1998). A key concern of this study, therefore, was to examine the feasibility of combining data from sites in different cultural settings for the purposes of pooled comparisons of service use and costs.

4.2 Study objectives and hypotheses

The overarching aim of the **L**ongitudinal **I**nvestigation of **D**epression **O**utcomes (LIDO study) is to explore the relationship between major depressive disorder in primary care patients and their quality of life and resource use, to be accomplished in a multi-centre, cross-national observational study with a prospective cohort of patients in primary care. A series of more specific objectives were formulated, including comparison of depressive symptoms, resource use and QoL over time among treated versus untreated patients, and identification of predictors of change in these domains (Patrick et al, 2000). The specific objectives of the economic dimension of the LIDO study were:

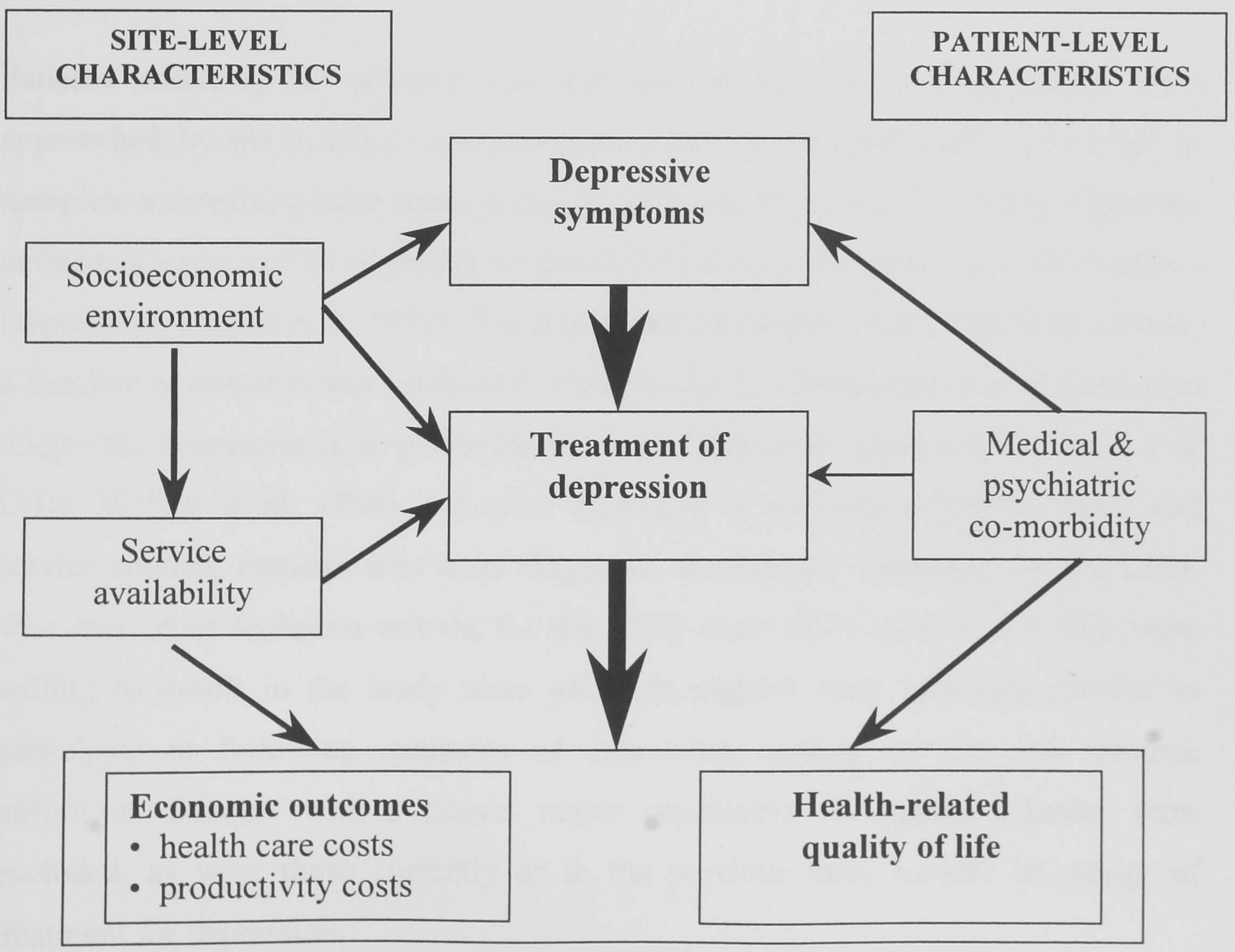
1. To develop a research method for the collection of health care service utilisation, associated costs data, and site-level socio-demographic and service profiles;

2. To describe and compare key domains of service use, costs and outcomes for different study sites and sub-populations;

3. To explore site-specific and cross-cultural relationships between service utilisation/costs and symptoms/QoL/functioning/treatment

A central set of hypotheses were generated over a number of initial meetings of collaborators, and were informed by the construction of a conceptual model (Figure 4.1) which attempted to address a number of key research questions relating to potential cross-sectional and longitudinal associations, including how treatment received at baseline predicts costs in later follow-up periods, how medical and/or psychiatric co-morbidity predicts subsequent costs, and whether improvement in depression is associated with significant reductions in health care costs.

Figure 4.1 Conceptual model of LIDO study economic hypotheses



4.3 Method

4.3.1 Selection of study sites, cases and instrumentation

Study sites

A number of research institutions, each with a successful track record of international collaborative research into quality of life, were approached and asked to participate in the study. Six out of the seven sites approached initially agreed to participate and concur with the international study protocol:

- Be'er Sheva, Israel (Dr Amir, Ben-Gurion University of the Negev)
- Barcelona, Spain (Dr Lucas, Fundacio Parc Tauli)
- Porto Alegre, Brazil (Dr Fleck, Univ. of State of Rio Grande do Sul)
- Melbourne, Australia (Dr Herrman, St Vincent's Hospital & CPS)
- St Petersburg, Russia (Dr Lomachenkov, Bekhterev Research Institute)
- Seattle, USA (Dr Patrick, University of Washington)

Case identification

Patients attending the primary care facilities of the participating centres were approached by the primary care physician, clinic or research staff and invited to complete a screening assessment package, subsequently scored for initial eligibility, defined as a score of 16 or greater on the CES-D (Centre for Epidemiologic Studies - Depression; Lyness et al, 1977). For those patients meeting initial eligibility criteria, a baseline assessment was conducted, which included administration of a depression diagnostic instrument (Composite International Diagnostic Interview, version 2.1 or CIDI; Weiller et al, 1994) and other measures of socio-demographic status and service contact. Patients who were diagnosed as clinically depressed by the CIDI, who met other inclusion criteria for the study (age 18-75 years), and who were willing to enroll in the study were asked to register their informed consent to participate in follow-up measures of depression, quality of life and resource utilisation. Patients with a known major psychiatric or organic disorder were excluded, as were those currently or in the previous three months in receipt of treatment for depression.

Instruments

A range of outcome measures in key study domains were employed at a series of follow-up assessment points over the course of the study (Table 4.1). The majority of the instruments selected for use in the study already had published versions available in the six LIDO centres. For those that were not available, standardised translation methods were employed in order to complete the battery of measures (Medical Outcomes Trust, 1997). For the economic component of the study - questions relating to service systems and their costs, site- and individual-level sociodemography and uptake of services by the sampled populations - three sets of instrumentation were specifically developed for the purposes of the study.

Table 4.1 Measurement flow chart

Measurement domain	***Instrument(s)***	***Administration***			
		Base-line	Month 3	Month 9	Month 12
Clinical measures					
Symptomatology	CIDI (Weiller et al, 1994)	✓		✓	
	CES-D (Lyness et al, 1977)	✓	✓	✓	✓
	SCL-90 anxiety subscales (Derogatis et al, 1976)	✓	✓	✓	✓
Quality of life	Quality of Life Depression Scale (QLDS; Hunt and McKenna, 1992)	✓	✓	✓	
	WHOQOL Bref (WHOQOL Group, 1998)	✓	✓	✓	
Functioning	MOS SF-12 (Ware and Sherbourne, 1992)	✓	✓	✓	
Comorbidity	AUDIT (Qs 1-3; Seppa et al, 1995)	✓			✓
	Comorbid conditons (Wells et al, 1991)	✓			✓
Economic measures					
Sociodemography	Demographic questions *	✓	✓	✓	✓
Resource utilisation	Resource utilisation questionnaire *	✓	✓	✓	✓
Service systems	Local sociodemography/service profile *	✓			
Service costs	Unit cost templates *	✓			

Notes: i) 9 and 12 month follow-up analyses (shaded columns) not reported in this thesis
ii) asterisked instruments specifically constructed/adapted for the LIDO study

4.3.2 Development of a site-level socio-demographic and service profile

The take up and subsequent effectiveness of services is determined to an (unknown) extent by the access, availability and quality of primary and secondary health services. Without comparable and standardised descriptions of the structure of service systems, analysis of the role of organisational characteristics in evaluating costs and outcomes is compromised. In this international study, it was therefore vital to have an understanding of the features that characterise each site's local service system. Moreover, differential levels of service utilisation, costs, functioning and outcomes within and between sites are predicted to be associated with socio-demographic variables such as age, gender, employment status and income. In addition to the collection of socio-demographic characteristics of study subjects, therefore, there is a need to derive a socio-demographic profile of the local population.

Several attempts have been made to develop a standard technology for mental health (and general medical) service description. However, none of the developed instruments have gained wide international acceptance, largely due to their failure to adequately capture the cross-cultural heterogeneity of service systems (Johnson et al, 1998). It has therefore been necessary to draw on a number of instruments and studies in order to obtain the required coverage of this study in depression. The principal instruments/studies upon which the Local Socio-demographic and Service Profile (see Appendix B) was based are:

Domain	***Instrument / study***	***Authors***
Socio-demography	Socio-demographic Schedule (SDS)	Beecham J, Johnson S and the EPCAT Group, 2000
Mental health services	Service Mapping Schedule (SMS)	Johnson S, Kuhlmann R and the EPCAT Group, 2000
Primary care services	WHO PPGHC study	Ustün TB and Sartorius N (eds) *Mental Illness in General Health Care*, 1995

Site investigators were requested to co-ordinate the completion of this profile, in collaboration with local service planners and researchers. The profile was completed for their *local catchment area* (data relating to the whole country were also requested

for some of the questions). In selecting the appropriate local catchment area to be profiled, the following principles were applied:

- a local catchment area is a *geographical region* within which a comprehensive set of mental health services is available.
- the local catchment area should be *representative* of the area from which study subjects are drawn.
- there should be readily *available information* relating to the local catchment area, usually in the form of regularly reported/updated statistics.
- socio-demographic and health service profiles should relate to the *same population* (i.e. select a catchment population for which both socio-demographic *and* service statistics are available).

4.3.3 Development of a service receipt schedule

A range of primary care, psychiatric, social and general medical services were identified which together were considered a comprehensive profile of potential service receipt for the patient population in the six international centres (Appendix C). The range of identified services was based upon the local clinical experiences of the site investigators and previous studies of service utilisation in the mental health field (Chisholm et al, 2000a; Chapter 3, Section 3.3.2). The three main categories of service contact were:

- *Primary care and outpatient services*: These are services which involve contact between primary / mental health care professionals and patients for some purpose related to the management of mental or physical illness (other than the delivery of inpatient or day services), and may occur in a hospital outpatient department, primary care centre, private clinic/practice or at the patient's own home. Average contact time includes consultation time only (not travelling or waiting time).

- *Day services*: These are services which are provided to several patients at a time and usually provide a combination of treatment for problems related to mental illness, structured activity, social contact and/or support. Facilities have regular opening hours.

- *Inpatient hospital services*: An inpatient stay in a hospital ward; both psychiatric and general medical admissions were incorporated.

In addition, all drugs that had been prescribed to the patient (not just those related to depression) were recorded, and finally a section that asked for patients' own perceptions about potential barriers to accessing care or treatment (treatment too expensive, care centre inconvenient to reach, discouragement from family members, etc.). An iterative process of cross-cultural validation was pursued in order to ensure standardised definitions and semantic equivalence of services across sites, resulting in a finalised baseline version of the schedule which could subsequently be translated into the local langauge of each participating centre.

4.3.4 Principles and processes of service costing

The principles employed in the LIDO study for the costing of services were closely based on existing guidelines (Beecham, 1995; Drummond et al, 1997; Hargreaves et al, 1998), and are summarised in Box 4.1. The *process* of costing can be broken down into three connected tasks: measurement of the quantity of resource use (via the collection of service receipt or utilisation data by individual clients or patients over a consistently defined period); the assignment of unit cost or prices, that is the costing or pricing of each of the service used; and the combination of these two sets of information in order to calculate the individual patient's cost (Beecham, 1995). In the context of international studies, a fourth task can be added, namely the transformation of site-specific service costs into a common currency, which enables the direct comparison of costs using the same metric (such as international dollars).

In the context of the LIDO study, the first task was carried out via the administration of a service receipt schedule developed specifically for use in this project (see Section 4.3.3). For the second step, that is the costing or pricing of each of the service used, there were four main categories of cost that needed to be quantified: salaries / wages of staff employed in the direct care and management of patients; facility operating costs where the service is provided (cleaning, catering etc.); any overhead costs relating to the service (personnel, finance etc.); and the capital costs of the facility where the service is provided (land, buildings etc.). A unit cost

protocol, similar to that employed in the EPSILON study, was developed in order to facilitate the computation of these categories of cost, both at the level of individual professionals and facilities (Appendix D).

Box 4.1 The LIDO study: principles of unit cost data collection

1. The broad perspective to be employed in the costing of services is an economic one, such that in principle service costs are derived by reference to their *marginal long-term opportunity costs* (Knapp, 1995). For example, the opportunity cost of an inpatient hospital bed is in principle to be based on established calculations of how those resources could be used in their best alternative use, such as a day care place or an entirely different service within or outside mental health care. In practice, derivation of costs in this way is difficult. It is therefore conventional to use *short-term average costs as a proxy* for long-run marginal costs (Beecham, 1995; Beecham and Knapp, 1992). There is widespread consensus in health economics as to the validity of these proxies, provided that necessary adjustments such as the inclusion of capital in a unit of service provision are made (see Chisholm et al, 1997c for a practical application to mental health residential care; see Netten and Dennett, 1998 for a range of UK unit costs of health and social care).

2. Economic or opportunity costs are distinct from market prices, charges, or per diems. Profit motives, varying accounting and reimbursement practices mean that per diems and hospital charges are unlikely to represent a good proxy of opportunity cost. For example, a private, for-profit company may charge a fee above what it actually costs to provide care. Where fees or charges are used, therefore, this should be acknowledged, justified and, ideally, adjusted to reflect the real economic cost.

3. Estimation of costs should either be based on local catchment area data, or where this is not possible, on national data so long as the local catchment area is typical or representative of the national picture. As a general rule, the unit cost of contacts with primary care workers or outpatient consultants are not likely to vary significantly (making national estimates an acceptable choice), whereas the unit cost of day care provision and particularly inpatient services may vary considerably between different areas of the country. Facility-specific estimates should be obtained if possible. A further general principle is that routinely collected data are preferable to data collected on a one-time basis.

4. A final principle of cost evaluation is that the resource implications of *all* elements of a service should be considered. Again, there are difficulties in realising this principle on pragmatic grounds; for instance, the full cost of a day care place may include inputs from unpaid volunteer staff or financial contributions from clients over and above those of the managing agency. Closely related to this issue is the analytical perspective of the study. Possible points of view include a governmental department or ministry (health or other), the statutory sector as a whole, a provider or insurance agency, an employer, the patient and/or his family, and society generally. The societal perspective is the broadest but also the most complicated perspective to adopt.

The third task - combination of service use and unit cost data - is a straightforward computational exercise that is best undertaken using a computer spreadsheet or database package. For example, the cost of primary care would be derived by multiplying the number of contacts by the average duration of contact, then by the unit cost per minute of face-to-face contact. Individual service component costs can

subsequently be aggregated to derive total costs per individual or costs broken down by sector, primary versus secondary care, generic versus specialist care, and so forth. For the final stage, transformation of service costs into a common currency, a number of alternative mechanisms can be considered, including official currency exchange rates, GDP 'purchasing power parities' or a more specific set of purchasing power parities for the particular sector of interest, based on a selected basket of sector-specific commodities (see Section 3.3.3 for a more detailed discussion). Following review and experimentation with these alternative methods, PPPs were employed for the LIDO study, since they are readily available, avoid the limitations of exchange rates and provide a more robust set of conversion factors than the market-basket approach (Table 4.2).

Table 4.2 GDP purchasing power parities, 1997

	Australia	***Brazil***	***Israel***	***Russia***	***Spain***	***USA***
Australia		0.57	2.29	2.86	88.9	0.71
Brazil	1.75		4.0	5.0	156	1.25
Israel	0.44	0.25		1.25	38.9	0.31
Russia	0.35	0.20	0.80		31.1	0.25
Spain	0.011	0.006	0.026	0.032		0.008
USA	1.4	0.8	3.2	4.0	124.4	

(Source: World Bank, 1999; Table 5.6*)*

Data analysis and sample size considerations

Since the focus of the study was on unrecognised new episodes or diagnosed cases of major depression presenting to primary care providers, an important early consideration was on the expected number of patients who would need to be screened in order to derive a meaningful sample of positive cases for the duration of the study. Allowing for a potential attrition rate of 30% of enrolled cases and a caseload-constrained end sample of 150 cases per site, it was estimated that the screening package would need to be administered to approximately 4,300 individuals *at each site*. Minimum detectable differences with 80% power were derived, both

per site and for pooled data, for outpatient utilisation, CES-D and health status (Table 4.3). With respect to comparing the estimated 75 people per site who were treated versus those not treated at baseline, large differences in service costs (a factor of 2.5) would have to be present, whereas it seemed more likely that differences in QoL and initial CES-D would be detectable, especially if all the clients can be combined. In terms of change over time, patients' service costs would have to decrease by two-thirds in order to show a statistically significant difference (per site), or by 23% if site-data was pooled, whereas quite small changes could be detected in CES-D or health status. Finally, it was estimated that a differential of 2.74 points (or 1.03 if data is pooled) on CES-D score for treated versus untreated could be detected with 80% power. The difference in QoL score - 11.9 points per site, 4.5 if pooled - was thought to be probably too large to be attained, and there was insufficient data upon which to base an estimate for differences in service costs.

Table 4.3 Minimum detectable differences with 80% power

Comparison	N_1	N_2	Service cost	CES-D	Health status (QoL)
Treated vs non-treated	75	75	2.52	1.4	12.22
	x 7	x 7	1.48	0.5	4.61
Change from baseline	150	150	1.66	1.37	5.9
	x 7	x 7	1.23	0.52	2.2
Change in treated vs change in untreated	75	75	N/A	2.74	11.9
	x 7	x 7	N/A	1.03	4.5

4.4 Results

4.4.1 Description of sites and service systems

Barcelona, Spain

Location and socio-demography: Barcelona is the main city of the autonomous region of Catalonia in North East Spain, with a population of 1.7 million. The size of the population has remained very stable for twenty-five years, but with an increasing proportion of elderly people. The proportion of the population in full-time

employment (41%) is correspondingly quite low. Unemployment stands at approximately 10%. Health system: Barcelona is one of eight decentralised health regions in Catalonia, which operates a mixed health care model; health care is financed from federal and state-level dedicated tax contributions, and is provided for all citizens both through public and contracted private sector providers. Overall health spending in Spain amounts to 8% of Gross Domestic Product (GDP). Primary care services: Three urban primary care centres in Barcelona took part in the study, each covering a population of approximately 25,000 inhabitants and seeing 7,800 patient per month. Primary care centre staff include nurses, social workers and administrative personnel, as well as physicians, who see an average of 520 patients per month. Physicians and nurses also make home visits one day per week. An estimated 25% of visits are due to acute illness and injuries, 60% are due to chronic diseases and 10-15% because of psychological problems.

Be'er Sheva, Israel

Location and socio-demography: Be'er Sheva is located in the southern region of Israel in the Negev desert. Its population of 440,000 inhabitants is predominantly made up of younger adults (aged less than 45 years of age) and children, reflecting the lower socio-economic status and larger family units of this region of Israel. The main local sources of employment - manufacturing, business and education - broadly correspond to the national economy. The unemployment rate currently stands at 9.5%. Health system: Israel has a semi-public system, dominated by the country's four sick funds which are regulated by the Ministry of Health (which also has responsibility for mental health services). Insurance in a sick fund is compulsory for all citizens, financed through federal income taxation which is subsequently allocated to the sick funds. Health spending rose from 4.1% of GDP in 1995 to 8.2% in 1997. Primary care services: A number of centres of different sizes participated in the study. In the centre from which the majority of patients were recruited (Dimona), approximately 5600 patients are seen per month (a doctor: patient ratio of 1: 800), the majority of whom present with chronic illnesses (60%); psychological illnesses account for 10% of presented problems.

Melbourne, Australia

Location and socio-demography: The LIDO study catchment area was defined as the Melbourne metropolitan area in the state of Victoria, in which over three million people reside. Melbourne is characterised by its cultural diversity with a quarter of its inhabitants born overseas in a non-English speaking country. The local economy is service-orientated, with an unemployment rate of 9.1%. Health system: The main feature of the health care sector is Australia's Medicare scheme, financed through general taxation and a 1.5% levy upon personal income, which provides universal insurance against the costs of pharmaceuticals, public hospitals, private GPs and upon referral, private specialists (expenditure totals 7.8% of GDP). Mental health services are community-based, evidenced by the relatively low number of psychiatric beds (27 per 100,000 population over 18 years). Primary care services: The principal PHC centre involved in the study was the North Yarra Community Centre, which sees 6500 patients per month. The centre has 5.4 full-time equivalent (FTE) physicians (who see an average of 800 patients per month), 3.6 FTE nurses and 29 other staff. Psychological problems account for 20% of attendances.

Porto Alegre, Brazil

Location and socio-demography: The LIDO catchment area is Conceição, a district in the north of Porto Alegre, capital of the State of Rio Grande do Sul, Brazil. It has a population of 100,000 inhabitants, the majority of whom are younger adults and children (68%). 35% of the population earn less than US$200 per month, and 10% of working age adults are unemployed. Health system: Over the last two decades, access to health care in Brazil has evolved into a universal right of citizenship. Public health services together with private health care services form the "Sistema Único de Salúde" (SUS). Private non-profit and for-profit organisations provide the majority of medical assistance, particularly inpatient care. Brazil spends about 6.5% of its GDP on health, one half of which is private expenditure. Primary care services: The primary care unit (*Serviço de Saúde Comunitária Nossa Senhora da Conceição)* is composed of 13 units, including a 30-bed inpatient facility, and serves a population of 120,000 people (29,000 enrolled families). The unit has a total of 44 FTE doctors and 11 nurses, who between them see an estimated 17,400 patients per month (the

doctor: patient ratio is 1: 395), predominantly in the form of outpatient attendances; 12% of attendances are attributable to psychological problems.

Seattle, United States

Location and socio-demography: The LIDO site was located in south King County, a south-west portion of the Seattle metropolitan area with a population of 1.7 million residents. Seattle has a relatively high per capita income and a low rate of unemployment (4%). Health system: Health services are financed by a mixture of private insurance (covering approximately 75% of the population) and tax-supported insurance programs for low-income residents, older persons and persons with disabilities qualifying for the federally sponsored Medicare benefits. 5-10% of the population has no source of health insurance coverage and must pay out of pocket. Insurance coverage for mental health is often limited. Health expenditures amount to 13.7% of GDP. Primary care services: Patients were recruited from practices in the south-west Seattle metropolitan area, including residents of the cities of Burien and SeaTac. Practices were widely varying in composition, but were broadly representative of the market-based US health care system. Practice caseloads ranged from 500-1200 patients per month, with a typical doctor: patient ratio of 1: 350. Most attendances were attributable to chronic illnesses (70%), with acute and psychological problems accounting for half each of the other attendances (15%).

St Petersburg, Russia

Location and socio-demography: Situated in the North-West of Russia, St Petersburg is a city with a population of 4.7 million. 70% of the population are adults (aged between 16-65). The population has a high mortality rate (631 per 100,000 population under 65 years). Unemployment levels have grown significantly in recent years, although the official rate produced by the city's statistical bureau for residents registered for government work is only 2%. Health system: Health services are financed by a combination of state insurance and allocations from the city budget. Mental health services are financed solely from the city budget. Utilization of inpatient and outpatient services has been stable during the last decade, and is still orientated towards a hospital-based service (195 psychiatric beds per 100,000

population over 18 years). Primary care services: The study clinics from which study patients were drawn are generally representative of the Russian health care system. Each clinic serves a population of approximately 40,000 residents and sees an average of 25,000 patients per month. The ratio of patients to doctors is high (1,113 patients per month per doctor). Only 4% of reasons for attendance are attributed to psychological problems.

Socio-demographic, health system and primary care service indicators are summarised in Table 4.4, which illustrates the differential age and mortality structures, the diversity of health care financing and provision mechanisms and also the varying levels of health service availability or supply that are in place across the six participating sites. In terms of socio-demographic characteristics, there are marked differences in the age profile of the populations (ranging from a high proportion of children and young adults in Be'er Sheva and Porto Alegre to a relatively high percentage of older adults in Barcelona), the employment rate (40% in Barcelona, 70% in Seattle and 90% in St Petersburg, although the latter figure is the official government rate only) and mortality rate (from 66 deaths per 100,000 population under 65 years of age in Melbourne to nearly ten times this rate in St Petersburg).

There is also appreciable diversity across sites with respect to how health services are financed and provided, including the extent of publicly provided care, a threefold difference in the proportion of national income (gross domestic product) allocated to health care and a seven-fold difference in the number of psychiatric hospital beds. Finally, the profiles completed for participating primary health care centres reveals the varying caseloads, doctor to patient ratios and payment methods across the six LIDO sites. Such diversity is not in itself surprising, but has a potentially decisive role to play in the interpretation of resource utilisation and cost findings at the level of sampled populations.

Table 4.4 Site-level socio-demographic and service provision indicators

Indicator		Barcelona (Spain)	Be'er Sheva (Israel)	Melbourne (Australia)	Porto Alegre (Brazil)	Seattle (USA)	St Petersburg (Russia)
Sociodemography (local)							
Gender	% female	53	49	48	55	50	55
Age	% children	18	44	27	34	27	16
	% young adults	30	36	35	34	31	37
	% older adults	32	15	30	27	32	33
	% retired	21	7	11	6	10	14
Employ	% employed	41	44.5	57	48	70	90
	% unemployed	19	9.5	10	10	4	2
	% other	49	46	39	42	26	8
Mortality rate (per 100k population < 65 years)		196	157	66	443	191	631
Health care system							
Total expenditure (% GDP) [1]		8.0	8.2	7.8	6.5	13.7	5.4
Public sector (% total spend) [1]		71	75	72	49	44	77
Main finance source (sector)		Public	Public	Public	Private	Private	Public
Main provider (sector)		Private	Private	Public	Private	Private	Public
Overall typology (sector)		Semi-public	Semi-public	Public	Semi-public	Private	Public
Medical beds per 100k popn		604	545	400	558	499	782
Psychiatric beds per 100k		70	193	27	75	42	195
Primary care services (local)							
Caseload	(patients / month)	7800	5600	6500	17400	500-1200	28000
Staff	FTE doctors	15	7	5.4	44	1-6	22
	FTE nurses	14	5	3.6	11	2-4	> 200
Ratio	(doctor: patient)	520	800	1200	395	350	1270
Reason	% acute illness	25	30	20	74	15	40
	% chronic illness	60	60	60	20	70	56
	% psychological	10-15	10	20	6	15	4
Typical visit (minutes)		5	10	10-15	20	15	15
Access	% easy (< 0.5 hr)	100	100	65	85	90	80
Payment	consultation	State	State	Copay	State	Copay	State
	medication	Copay	Copay	Patient	Copay	Copay	Patient

[1] 1997 estimates (World Health Report; WHO, 2000)

4.4.2 Description of the sampled populations

A final sample of 1,180 primary care attenders with a CIDI diagnosis of major depression were enrolled into the study, out of a total of 2,363 primary care attenders who had screened positive (a score of 16 or over) on the CES-D screening measure. Further information on the recruitment of subjects into the LIDO study are reported elsewhere (Patrick et al, 2000; Herrman et al, 2000). Out of this sample of 1,180 patients, 140 were lost to follow-up at the three month assessment point. Comparison of baseline assessments between those who dropped out of the study and those who reached 3-month follow-up revealed a number of differences in socio-demographic characteristics (males, unemployed persons and those living alone were disproportionately represented in the drop-out sample) and clinical scores (CES-D and QLDS scores were slightly higher in the drop-out group), but not with respect to previous treatment or use of services. Since this latter category is the principal focus of interest, analyses of changes over the first 3 months of follow-up are focused on the 1,040 subjects for whom assessments were available at both time points, and are adjusted for these baseline socio-demographic and clinical differences.

Sociodemography

Comparison of the socio-demographic characteristics of the sampled populations who met eligibility criteria for the study in each site are given in Table 4.5 (categorical variables with adjusted standardised residuals greater than +/- 3 are highlighted to illustrate the more extreme relative contribution of cells to the chi-square test statistic). The mean age of all subjects was 40.2 years (SD 14.5), of which 11.5 years (SD 3.5) had been spent in education. There were statistically significant differences in these characteristics, with an inter-site range of 38.2 - 46.4 years (age) and 9.1 - 13.3 years (education). The highest mean age and years of education was reported in St Petersburg. The striking similarities with respect to the gender of the sampled populations - in each of the six sites, women constituted two-thirds to three-quarters of the sample (71.1 % overall) - is largely an artefact of the sampling strategy; in order to undertake sub-group analyses, a minimum of 50 males were required (which involved booster sampling of male attenders).

Table 4.5 Socio-demographic characteristics of the sampled populations

Service use and costs		*Barcelona (Spain)* (N = 194)	*Be'er Sheva (Israel)* (N = 165)	*Melbourne (Australia)* (N = 191)	*Porto Alegre (Brazil)* (N = 165)	*Seattle (USA)* (N = 158)	*St Petersburg (Russia)* (N = 167)	*All sites* (N = 1040)	F / χ^2
Age (years)	Mean (SD)	39.7 (14.4)	40.5 (13.7)	38.2 (13.4)	38.8 (13.4)	38.8 (13.7)	46.4 (16.7)	40.2 (14.5)	8.3 [a]
Education (years)	Mean (SD)	10.2 (3.5)	11.5 (2.7)	12.4 (3.8)	9.1 (3.3)	13.1 (2.1)	13.3 (3.0)	11.5 (3.5)	53.3 [a]
Gender	% male	27.6	33.9	33.0	23.0	30.4	25.1	28.9	
	% female	72.4	66.1	67.0	77.0	69.6	74.9	71.1	7.8
Marital status	% married	54.6	69.7 [b]	25.1 [c]	51.5	44.3	41.9	47.5	
	% no longer married	14.9 [c]	13.9 [c]	36.1 [b]	24.8	26.6	36.5 [b]	25.5	
	% never married	30.4	16.4 [c]	38.7 [b]	23.6	29.1	21.6	27.0	95.3 [a]
Living situation	% alone	7.8	4.8 [c]	25.1 [b]	8.5	19.7	15.6	13.7	
	% with family	86.0 [b]	87.9 [b]	44.0 [c]	83.0 [b]	64.3	73.7	72.8	
	% with others	6.2 [c]	7.3	30.9 [b]	8.5	15.9	10.8	13.5	136.9 [a]
Employment	% employed / students	64.9	54.9	60.2	53.0	70.1	53.3	59.5	
	% unemployed	6.2 [c]	20.7	23.6 [b]	18.3	14.6	10.8	15.6	
	% housewife/husband	18.0	14.0	9.4	18.9	7.0	4.8 [c]	12.2	
	% retired	10.8	10.4	6.8	9.8	8.3	31.1 [b]	12.7	110.4 [a]
Main income source	% salary / wages	58.8 [b]	49.4	32.4 [c]	44.5	59.0 [b]	41.3	47.4	
	% state benefits / pension	17.1 [c]	28.1	60.1 [b]	13.5 [c]	12.2 [c]	37.7	28.9	
	% family support / other	24.1	22.5	7.4 [c]	41.9 [b]	28.8	21.0	23.7	169.8 [a]

[a] statistically significant at $p<0.05$ [b] adjusted standardised residuals > + 3.0; [c] adjusted standardised residuals > - 3.0

The proportion of subjects who were married ranged from 25.1% in Melbourne to 69.7% in Be'er Sheva, with a grand mean of 47.5%. The low rate in the Melbourne sample is reflected by high numbers of people no longer married (36.1%) or never married (38.7%), as well as by the relatively high proportion living alone (25.1%) or with non-family members (30.9%). A quite high proportion of cases in St Petersburg were also no longer married (36.5%). There was a clear similarity in the living situation of subjects from Barcelona, Be'er Sheva and Porto Alegre, characterised by a very high percentage of subjects living with family (83.0 – 87.9%).

Finally, there were appreciable inter-site variations in employment status; the proportion of subjects who were employed (or students) ranged between 53.0 - 70.1%, while the unemployment rate among the six sampled populations ranged between 6.2% in Barcelona to 23.6% in Melbourne. The unemployment rate in the sampled populations of all sites (except Barcelona, which shows the opposite trend) is notably higher than that for the general population (Table 4.4). Days absent from work for subjects in open or sheltered employment (or students) are reported in Table 4.6. At baseline, mean days absent from work (out of 65 working days in the previous 3 months) exceeded 10 in Barcelona (11.4 days, or 17%), Be'er Sheva (11.8, 18%) and St Petersburg (16.3, 25%). At 3-month follow-up, the number of individuals reporting work absences fell in all sites, and in four of the sites the average level of absence also fell (although in Be'er Sheva and Melbourne, average days went up). For the sample as a whole, 40 less people reported absence, and average days of absence decreased by 4.3% (2.8 days).

Table 4.6 Unrecognised major depression: days absent from work [a]

	Baseline				3 month follow-up				Change		
	N	Mean	SD	% [b]	N	Mean	SD	% [b]	N	Mean	% [b]
Barcelona	111	11.4	23.9	17.5	100	6.5	18.9	10.0	- 11	- 4.9	- 7.5
Be'er Sheva	76	11.8	17.0	18.1	70	14.2	22.2	21.8	- 6	2.4	3.7
Melbourne	81	8.2	16.8	12.6	69	8.5	20.4	13.1	- 12	0.3	0.5
Porto Alegre	77	5.9	16.5	9.0	67	5.0	17.3	7.7	- 10	- 0.9	- 2.7
Seattle	106	6.4	12.5	9.8	105	4.0	5.8	6.2	- 1	- 2.4	- 3.6
St Petersburg	89	16.3	22.6	25.1	89	6.9	15.7	10.6	0	- 9.4	- 14.5
Total	**540**	**10.0**	**19.1**	**15.4**	**500**	**7.2**	**17.2**	**11.1**	**- 40**	**- 2.8**	**- 4.3**
F statistic	*3.91 (p=0.002)*				*3.46 (p=0.004)*						

[a] inclusion criteria: open or sheltered employment and students [b] out of the last 90 days / 3 months

4.4.3 Descriptive analysis of service use, costs and outcomes

Service utilisation

Service utilisation rates by the sampled populations in the six sites are reported in Table 4.7. Numbers of contacts with a range of professionals have been aggregated into three categories (one-on-one contacts with health and social care professionals; day care / support group attendances; and inpatient days), and are not adjusted for potential baseline differences (such as illness severity or comorbidities). The mean numbers of visits to individual health and social care professionals in the three months prior to baseline ranged from 5.7 (SD 6.4) in Barcelona to 11.4 (SD 13.6) in Seattle, with an overall mean of 8.4 visits (SD 9.5). The average number of attendances at a day care centre or support group in the previous three months was less than one in all sites except Seattle (1.9 attendances, SD 9.7). Likewise, the only site where the number of inpatient days out of the previous 90 days exceeded one was St Petersburg (2.4 days, SD 7.7). These baseline results for primary care attenders with an (unrecognised) diagnosis of major depression indicate a reliance on general medical services at the primary care level and a correspondingly low level of specialist or secondary care inputs. In all sites there were appreciable reductions in contact rates with PHC and outpatient care providers over the first 3 months of follow-up, but little change in day care attendances or inpatient days. When all sites are pooled, such changes are statistically significant, indicating the need for large sample sizes to detect these differences.

Service costs

Table 4.8 provides a breakdown of the costs of service utilisation at baseline and 3-month assessments, both by type of contact (PHC and outpatient, day and inpatient care) and by sector (mental health and general medical care). Mental health care speciality costs included contacts with a psychiatrist, a psychologist, a mental health worker, attendances at day care centres or support programmes for people with mental health problems, and admissions to a psychiatric hospital. A key finding from the application of unit costs to service use data was that, even after attempted adjustment for the relative price of health care services in the six sites through the

application of purchasing power parities, very marked differences in cost remain, reflecting differential levels of service volume or uptake. Most starkly, there was a 30-fold difference in the total average service cost between study subjects in Seattle ($809 over 3 months) and St Petersburg ($26 over the same period). (Since contact rates were not so noticeable different, this perhaps suggests an under-adjustment in the parity measure.) A second clear observation is the very considerable deviation around reported mean values, indicating the marked variation in service uptake between subjects in individual sites; standard deviations are typically at least double the mean value. A third finding from these analyses is evidence of a cost-offset effect; although the overall cost of care did not alter over the first three months of follow-up, the proportion of cost associated with speciality mental health care did change (Figure 4.3). Across all six sites, general medical care service costs decreased significantly, by an average of $57 (95% CI –110, -3), while mental health care costs increased by an average of $47 (95% CI –15, 110). For individual sites, however, paired sample t-tests of cost differences over time were not significant, partly due to modest effect sizes, further compounded by the marked uncertainty around point estimates of cost.

Clinical outcomes

Key measures of outcome available for analysis at the interim, 3-month assessment point were the CES-D, the QLDS and the SF-12 (the CIDI, principal measure of depression, and also measures of co-morbidity, were not available as they were only being administered at the principal 9-month follow-up point). For the CES-D, QLDS and mental health summary score of the SF-12, there were statistically significant improvements in all sites between baseline and 3-month follow-up. There were also statistically significant differences in the SF-12 physical health summary score for three of the sites (Barcelona, Seattle and St Petersburg). Although there were significant inter-site variations in the mean scores for these measures, these results provide a clear and consistent picture of positive change in symptom severity, quality of life and functioning cross-culturally. CES-D scores decreased by an average of 6 points (from 29.3 to 23.3., 95% CI -6.7, -5.3), QLDS scores decreased by 1.3 points (95% CI –1.5, -1.0; lower scores indicate better QoL) and SF-12 mental health summary score rose by an average of 4.9 (95% CI, 4.1, 5.6).

Table 4.7 Unrecognised depression in primary care: changes in service utilisation between baseline and 3 month follow-up

Resource utilisation	*Barcelona (Spain)* (N = 194)		*Be'er Sheva (Israel)* (N = 165)		*Melbourne (Australia)* (N = 191)		*Porto Alegre (Brazil)* (N = 165)		*Seattle (USA)* (N = 158)		*St Petersburg (Russia)* (N = 167)		*All sites* (N = 1040)		
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	F statistic
Service contacts - baseline															
• PHC & outpatient visits	5.72	6.4	10.19	11.4	8.28	8.5	6.01	7.1	11.41	13.6	9.41	10.0	8.40	9.9	9.48 [a]
• Day care attendances	0.51	4.6	0.13	0.6	0.73	3.5	0.86	4.4	1.95	9.7	0.44	2.5	0.75	5.0	2.59 [a]
• Inpatient days	0.40	1.8	0.58	2.2	0.43	1.7	0.26	1.5	0.24	1.0	2.44	7.7	0.71	3.5	10.14 [a]
Service contacts - 3 months															
• PHC & outpatient visits	5.20	7.2	7.66	9.9	7.92	8.9	4.03	4.9	9.27	10.0	4.40	7.4	6.40	8.4	11.42 [a]
• Day care attendances	0.46	4.6	0.27	2.2	1.21	4.6	0.90	4.2	3.80	15.0	0.18	1.3	1.10	6.9	6.53 [a]
• Inpatient days	0.13	0.9	0.66	2.5	0.23	0.8	0.43	3.3	0.07	0.5	0.69	3.2	0.36	2.2	2.34 [a]
Service contacts - change		95% CI		95% CI		95% CI		95% CI		95% CI		95% CI		95% CI	
• PHC & outpatient visits	- 0.52	-1.7; 0.7	**- 2.52**	**-1.0; -4.0**	- 0.36	-1.6; 0.9	- 1.99	-3.1; 0.8	- 2.14	-4.4; 0.2	- 5.02	-6.6; 3.4	**- 2.01**	**-2.6; -1.4**	4.93 [a]
• Day care attendances	- 0.04	- 0.3; 0.2	0.14	-0.4; 0.1	0.49	-0.1; 1.0	0.05	-0.5; 0.6	1.85	- 0.2; 3.9	- 0.26	-0.6; 0.06	**0.35**	**0.0; 0.7**	2.98 [a]
• Inpatient days	- 0.27	-0.5; 0.02	0.08	-0.5; 0.3	- 0.20	-0.5; 0.1	0.17	-0.3; 0.7	- 0.17	- 0.4; 0.1	- 1.76	-3.0; 0.5	**- 0.35**	**-0.6; -0.1**	5.68 [a]

Notes: **bold** confidence intervals signify a significant difference at $p<0.05$ [a] F statistic significant at $p<0.05$

Table 4.8 Unrecognised depression in primary care: changes in service costs between baseline and 3 month follow-up

Service costs (US $, PPP)	*Barcelona (Spain)* (N = 194)		*Be'er Sheva (Israel)* (N = 165)		*Melbourne (Australia)* (N = 191)		*Porto Alegre (Brazil)* (N = 165)		*Seattle (USA)* (N = 158)		*St Petersburg (Russia)* (N = 167)		*All sites* (N = 1040)		
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	F statistic
Service costs - baseline															
• PHC & outpatient visits	50	70	228	332	180	252	304	462	523	691	10	20	207	404	42.6 [a]
• Day care attendances	86	823	32	156	33	130	53	297	131	545	5	29	56	439	1.76
• Inpatient days	90	420	232	892	152	660	63	389	151	716	11	37	116	586	3.10 [a]
Mental health care	2.5	21	4	22	41	191	57	296	57	239	3	26	27	173	4.24 [a]
General medical care	215	939	489	1022	326	710	365	619	755	1259	23	53	353	878	13.5 [a]
Total	217	938	493	1021	367	733	423	669	809	1293	26	59	380	898	14.8 [a]
Service costs - 3 months															
• PHC & outpatient visits	60	124	183	290	186	271	239	434	525	1378	5	12	193	609	15.5 [a]
• Day care attendances	81	810	62	531	51	201	72	358	346	1842	2	15	99	847	3.41 [a]
• Inpatient days	30	205	277	1100	62	283	100	854	23	166	3	16	81	585	4.61 [a]
Mental health care	12	68	10	43	61	200	70	337	317	2659	0.2	1.6	74	1051	2.13
General medical care	148	825	510	1283	238	419	343	1028	581	863	10	27	296	858	11.6 [a]
Total	160	826	520	1287	300	517	415	1082	904	3064	10	27	372	1452	8.14 [a]
		95% CI		95% CI		95% CI		95% CI		95% CI		95% CI		95% CI	
Service costs - change															
• PHC & outpatient visits	10	-8; 28	- 46	-88; 3	6	-33; 45	- 64	-139; 10	2	-235; 239	- 5	- 8; 2	- 14	-54; 24	0.40
• Day care attendances	- 5	-55; 46	30	-36; 6	17	-4; 39	18	-44; 81	215	-54; 484	- 3	- 7; 1	42	-2; 86	2.16
• Inpatient days	**- 60**	**-117; - 2**	45	-129; 220	- 90	-186; 6	36	-93; 166	- 127	-244; 11	- 8	-14; 2	- 35	-79; 9	1.58
Mental health care	9	-0.5; 19	6	-1; 14	20	-8; 49	13	-46; 72	260	-149; 669	- 3	-7; 1	47	-15; 110	1.60
General medical care	- 66	-141; 9	21	-173; 215	- 87	-190; 16	- 22	-188; 144	- 173	-352; 6	- 13	-21; 5	- 57	**-110; -3**	0.98
Total	- 60	-132; 19	27	-167; 221	- 67	-177; 43	- 8	-184; 168	95	-399; 589	- 16	-25; 7	- 8	-96; 80	0.28

Note: **bold** confidence intervals signify a significant difference at $p<0.05$ [a] F statistic significant at $p<0.05$

Table 4.9 Unrecognised depression in primary care: changes in clinical outcomes between baseline and 3 month follow-up

Outcome measure	*Barcelona (Spain)* (N = 194)		*Be'er Sheva (Israel)* (N = 165)		*Melbourne (Australia)* (N = 191)		*Porto Alegre (Brazil)* (N = 165)		*Seattle (USA)* (N = 158)		*St Petersburg (Russia)* (N = 167)		*All sites* (N = 1040)		
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	F statistic
Clinical outcomes: baseline															
• CES-D total score	28.2	10.0	26.6	10.9	30.5	10.5	31.2	10.1	32.8	11.0	26.8	10.1	29.3	10.7	9.79 [a]
• QLDS total score	15.3	4.6	14.6	5.4	16.4	4.7	16.5	5.3	17.3	4.8	13.7	4.6	15.6	5.0	12.8 [a]
• SF-12 physical score	44.0	11.2	41.3	11.8	41.2	12.2	44.5	10.0	41.2	11.5	37.8	9.3	41.7	11.2	8.28 [a]
• SF-12 mental score	36.0	11.6	36.0	10.6	32.6	8.1	36.1	9.6	30.1	8.5	33.3	8.7	34.0	9.9	9.45 [a]
Clinical outcomes: 3 months															
• CES-D total score	20.9	11.1	21.4	11.5	24.8	10.8	26.1	13.4	23.6	14.0	23.4	10.2	23.3	11.9	4.79 [a]
• QLDS total score	14.2	4.3	13.1	5.0	15.2	4.9	15.1	5.2	15.6	5.3	13.0	4.7	14.4	5.0	8.46 [a]
• SF-12 physical score	45.5	10.9	42.9	11.6	41.2	12.2	45.3	10.3	42.9	11.0	39.5	10.0	42.9	11.2	8.26 [a]
• SF-12 mental score	41.2	11.6	43.1	10.7	36.8	10.8	39.4	11.6	37.2	12.2	36.1	10.4	38.9	11.5	9.12 [a]
Clinical outcomes: change		95% CI		95% CI		95% CI		95% CI		95% CI		95% CI		95% CI	
• CES-D total score	- 7.4	**-9.1; -5.6**	- 5.2	**-7.0; -3.4**	- 5.7	**-7.3; -4.2**	- 5.2	**-6.9; -3.5**	- 9.2	**-11.2; -7.2**	- 3.3	**-5.0; -1.7**	- 6.0	**-6.7; -5.3**	5.05 [a]
• QLDS total score	- 1.1	**-1.7; -0.6**	- 1.5	**-2.2; -0.8**	- 1.3	**-1.9; 0.6**	- 1.4	**-2.0; -0.7**	- 1.8	**-2.4; -1.1**	- 0.7	**-1.3; -0.1**	- 1.3	**-1.5; -1.0**	1.17
• SF-12 physical score	1.4	**0.1; 2.7**	1.6	0.0; 3.2	0	-1.2; 1.2	0.9	-0.3; 2.1	1.7	**0.0; 3.4**	1.6	**0.4; 2.8**	1.2	**0.6; 1.7**	0.88
• SF-12 mental score	5.3	**3.6; 7.0**	7.1	**4.9; 9.3**	4.2	**2.5; 5.8**	3.3	**1.6; 5.0**	7.1	**5.1; 9.2**	2.8	**1.1; 4.4**	4.9	**4.1; 5.6**	3.98 [a]

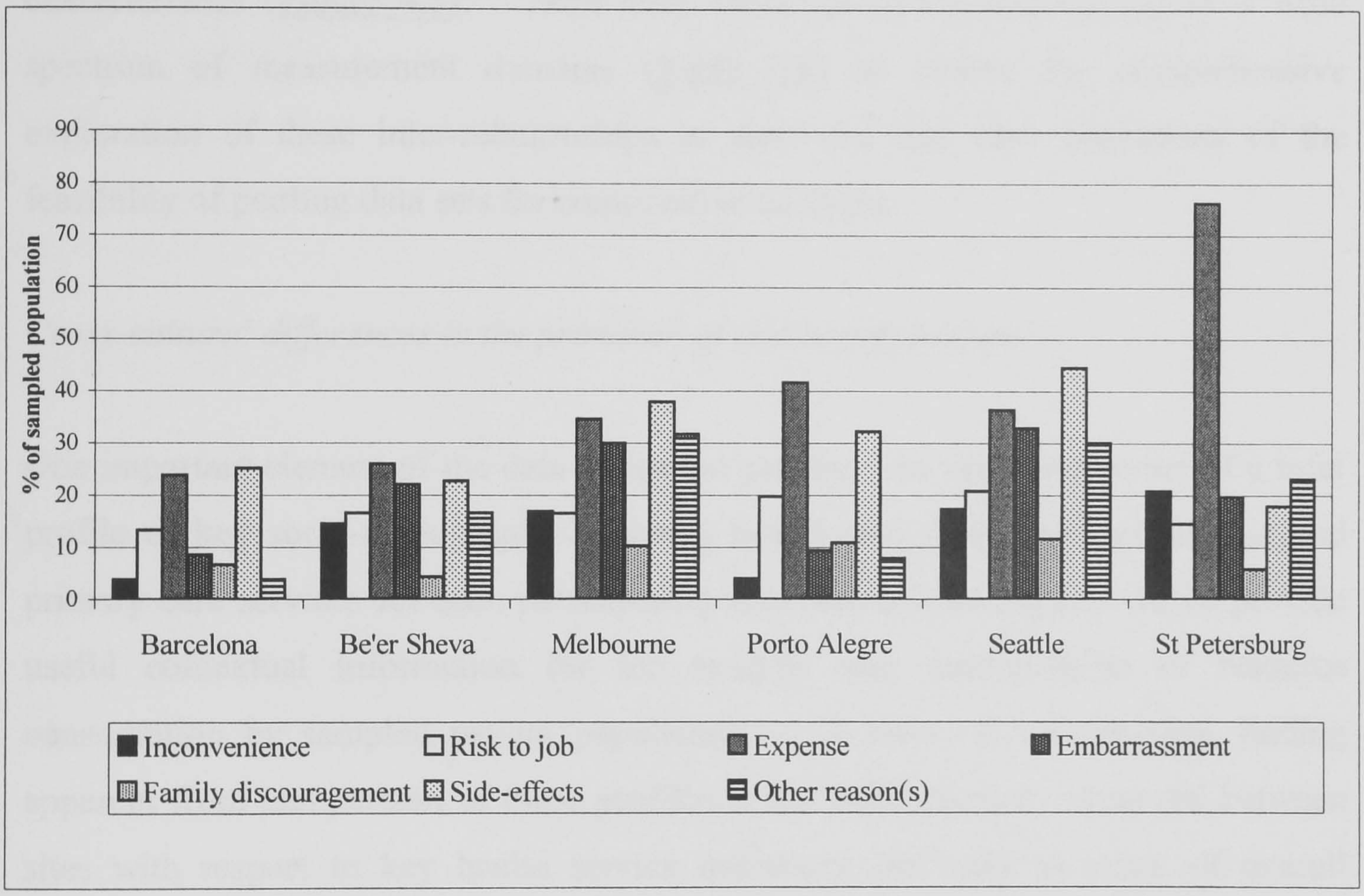
Note: **bold** confidence intervals signify a significant difference at $p<0.05$

[a] F statistic significant at $p<0.05$

Barriers to access

Differential patterns of service utilisation may not only be related to severity of distress or comorbidities, but also to supply-side factors such as distance from the agency, affordability of treatment, or awareness about the change intervention can bring about. Information was therefore sought on the health-seeking behaviour and perceptions of care of the sampled populations, in order to explore issues around access to services. Sociocultural factors affecting use of services at baseline assessment are shown in Figure 4.2.

Figure 4.2 Sociocultural factors: perceived barriers to access and treatment



The key factors identified by subjects were the cost of care (over 20% in all sites, rising to 76% in St Petersburg), feelings of personal embarrassment/shame (20% or more in Be'er Sheva, Melbourne, Seattle and St Petersburg), and concern about the side-effects of medication (inter-site range: 18-44%). Lower-level concerns were the risk to one's job, the convenience of getting to treatment centres and discouragement from family members to seek care. Other reasons, one or more of which were identified by over 20% of subjects in Melbourne, Seattle and St Petersburg, were mainly focused around the perception that care, if sought, would not be effective or of good quality.

4.5 Discussion

An integral aim of the LIDO study, an international prospective investigation of the economic and quality of life correlates relating to recognised depression in primary care, was to compare the uptake of available treatment and care in each of the six participating sites and to observe the impact of this treatment over time on subsequent resource utilisation, work disability and health-related quality of life. In addressing this aim, study investigators have been mindful of the need to appreciate the complex set of inter-relationships that exist between these (and other) parameters, including the potential influence of site-level service and socio-cultural characteristics (Figure 4.1). Data have therefore been collected across a wide spectrum of measurement domains (Table 4.1) to enable the comprehensive exploration of these inter-relationships in each site and also assessment of the feasibility of pooling data sets for comparative analyses.

Cross-cultural differences in the provision of and access to care

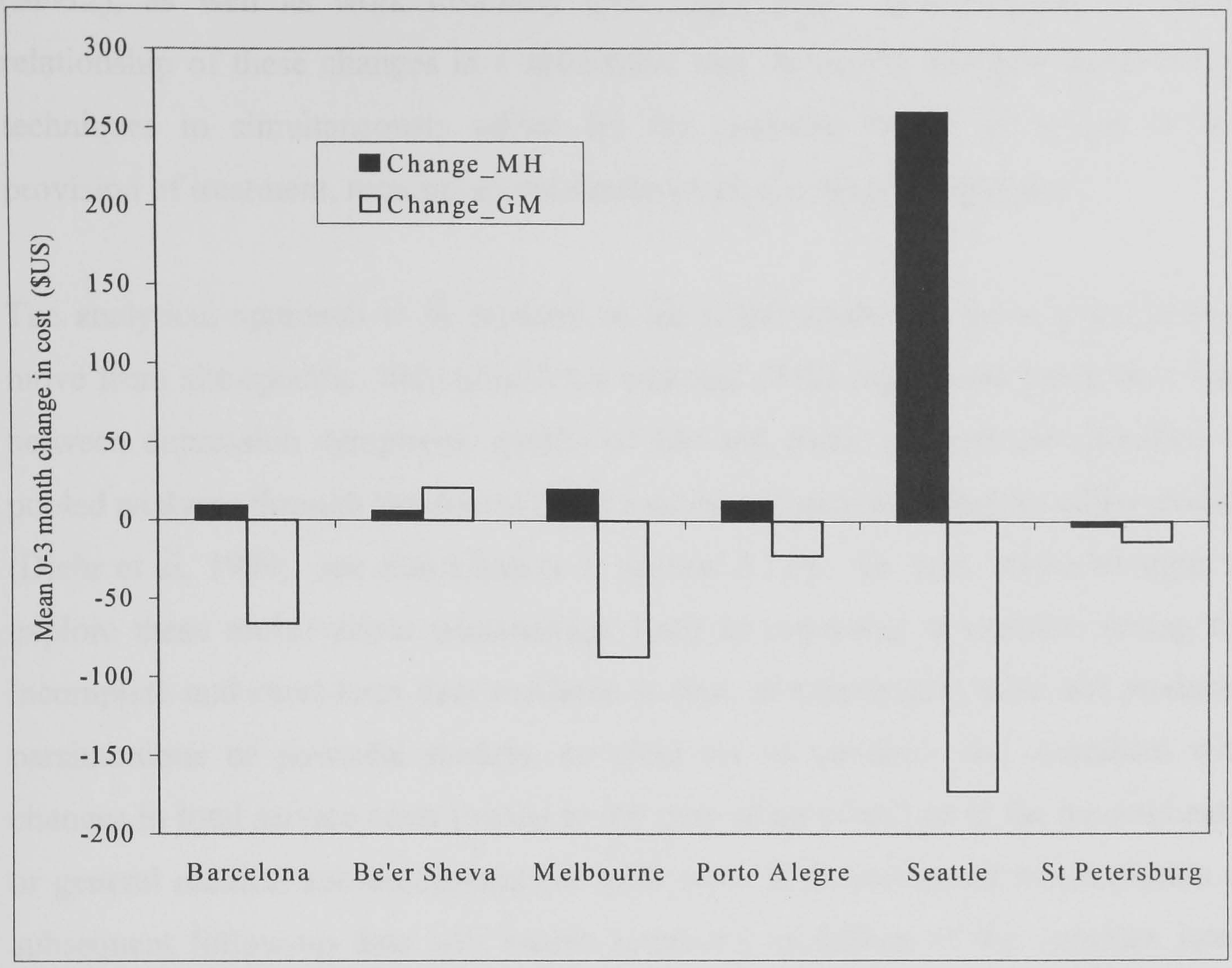
One important element of the data collection process was the construction of a brief profile of key socio-demographic features, health care financing mechanisms and primary care services for each participating site, which it was hoped would provide useful contextual information for the analysis and interpretation of resource consumption by sampled patient populations. A basic, if unsurprising, finding apparent from comparison of these profiles is the wide diversity observed between sites with respect to key health service indicators, not only in terms of overall expenditure and service inputs (for example, a threefold difference in the proportion of GDP devoted to health care and a sevenfold difference in the numbers of psychiatric beds available), but also in terms of the underlying model of health care finance and provision (two public, three semi-public and one private systems). A number of these differences appear to be borne out by analysis of baseline assessments for the sampled populations. For example, service utilisation patterns in the relatively well-resourced, managed care system prevailing in Seattle are rather different to those found in the lower-resourced, hospital-based system of St Petersburg, arguably reflecting differences in the principal locus of care.

Links can also be made between site-level indicators and assessment of subjects' socio-demographic characteristics and perceived barriers to access and treatment (Figure 4.2). One clear illustration, in common with other epidemiological evidence (Bland, 1997), is that despite being equally distributed in the overall population of the six catchment areas, rates of depression are higher among female primary care attenders, outnumbering men in the sampled populations by a factor of at least two even after specific booster sampling for males. A further striking example is the high proportion of subjects in the St Petersburg catchment area (76%) for whom cost is a perceived barrier to treatment, which is in line with the payment mechanism for medications in primary care and the current economic situation in Russia, as well as the high proportion of retired and unemployed study subjects in this site. Further and more sophisticated analyses of these and other potential associations (via multivariate regression and random effects models) will be an integral component of the final follow-up analyses of the LIDO study once all data have been collated (including CIDI depression status and the extent of co-morbidity at 9 months).

The cost-offset effect associated with recognised major depression

Participating primary care providers were informed of the diagnostic status of all study subjects in their local area (even if the physician him/herself had not made such a diagnosis of depression). The broad effect of this across the participating sites over the first three months of the follow-up period was an increase in the amount of specialist mental health care provided to sample populations (by definition, such care was negligible for the period preceding baseline since depression treatment was an exclusion criterion of study eligibility). What is also generally apparent is that this specialist care was provided in place of, rather than in addition to, general medical care service use. Such a cost-offset effect is shown in Figure 4.3, which illustrates the extent of change in mental health and general medical care costs in the six sites. The most pronounced cost-offset is apparent in Seattle, where mental health speciality costs rose by $260 and general medical costs fell by $173 over a three month period. Elsewhere, too, there were clear-cut shifts in the pattern of utilisation (Barcelona, Melbourne and Port Alegre). In Be'er Sheva both cost categories increased very slightly and in St Petersburg both fell from what was already a very low baseline.

Figure 4.3 Cost-offset in unrecognised major depression (0-3 months)



Ongoing and future analyses of costs, quality of life and depression

The observed baseline diversity across participating centres with respect to health seeking behaviours, in addition to organisational characteristics of health care, raises both a question and a challenge to health service researchers. The question is the extent to which it is sensible or feasible to pool data from participating sites, either with a view to enhancing the power with which study hypotheses can be addressed or in a bid to carry out standardised comparative analyses. Put another way, is it wise to compare resource utilisation patterns and associated costs in depressed subjects in Seattle to their counterparts in St Petersburg? The answer to this question is also the challenge to health service researchers just posed, namely integrated, simultaneous assessment of individual-level and site-level characteristics.

Preliminary longitudinal analyses of the LIDO data set reported here, relying only on the 3-month follow-up assessments, has shown that changes in service utilisation are accompanied by positive and significant improvements in depression score (as

measured by the CES-D screening measure), quality of life (QLDS) and functioning (SF-12), as well as work disability (see Table 4.6). Disentangling the inter-relationship of these changes in a systematic way, however, adopting multi-variate techniques to simultaneously adjust for the potential effects of access to and provision of treatment, remains an outstanding task for study investigators.

The analytical approach to be pursued in the LIDO study will be to progressively move from site-specific, individual-level analyses of the inter-relationship over time between depression symptoms, quality of life and costs, towards consideration of pooled analyses through the execution of a series of fixed- and random-effect models (Diehr et al, 1999; see also Chapter 3, section 3.3.4). To date, initial attempts to explore these multi-variate relationships from an economic perspective (using the incomplete and short-term data available at time of submission) have not produced parsimonious or powerful models; no clear set of variables are associated with changes in total service costs (owing to the cost-offset effect) or in the mental health or general medical sub-components of total cost. It is anticipated that inclusion of subsequent follow-up data will enable improved modelling of the complex inter-relationships that exist between depressive symptoms, health seeking behaviours and user outcomes. For these analyses, varying combinations of sites and site-level variables will be introduced into these models, with the expectation that pooled data for certain combinations of countries – that is, those with overlapping socio-economic and health system characteristics – will perform better than other combinations.

In so doing, we will be seeking to generate new insights into the extent to which site-level characteristics, such as relative levels of service provision, access and expenditure, have an effect on individual costs and outcomes. Such insights stand to tell us much about the opportunities in different regions of the world for reducing the current international burden of depression.

Acknowledgements

The LIDO study is sponsored by Eli Lilly Company, and co-ordinated by Health Research Associates (HRA) in Seattle. A core Research Team provides the scientific leadership, with representation from Eli Lilly, HRA and the principal consultant to the study, Dr Donald Patrick. The research team is supported by a number of additional Advisors expert in different aspects of the study, including depression, quality of life and health economics. Finally, in each of the six participating centres there is a principal Site Investigator. All of these individuals, listed below, have directly contributed to the design, implementation and analytical framework of the LIDO study.

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5. Mental health economics demonstration project in India and Pakistan: the MENDIP study

5.1 Rationale

As reviewed in Chapter 2, international epidemiological research has demonstrated the very considerable public health burden that psychiatric disorders impose on individuals, communities and health services throughout the world. Primary care physicians participating in an international study of psychological problems in general health care, for example, identified an average of 24% of attendees as being a 'case' with a psychological disorder (Ustün and Sartorius, 1995), while the *Global Burden of Disease* study (GBD) estimated that 10.5% of GBD in low- and middle-income countries is attributable to neuropsychiatric disorders (Murray and Lopez, 1996; WHO, 1999). National studies carried out in India and Pakistan have similarly shown both the very high prevalence of psychiatric disorder in rural communities, particularly anxiety and depression among women (Mumford et al, 1996, 1997; Srinivasa Murthy, 1996), and the consequences of this disorder in terms of disability (Patel et al, 1998).

The GBD study also estimated that only 8.4% (out of 83 million) episodes of depression in the developing world receive treatment while in developed countries the proportion in receipt of treatment is 35%. Since the study also estimated that standard treatment for depression will reduce disability by a factor of two (the disability weight drops from 0.6 to 0.3), it is possible to project that the application of currently available technology to the 76 million depressed individuals in the developing world who do not receive treatment could potentially reduce the total burden of illness due to depression by about 46%, saving 19.5 million DALYs per year. Alternatively, increasing the rate of treatment to that currently achieved in the developed world would reduce the burden of illness due to depression in the developing world by 13%, saving 5.7 million DALYs per year.

One model of mental health care and prevention that has long been advocated as an appropriate way forward in many low-income countries is one that is integrated into the local community context, particularly the existing primary health care system (WHO, 1975, 1979; Sartorius and Harding, 1983; Schulsinger and Jablensky, 1991). The strengths of this approach include the wide coverage that it can expect to attain, the holistic concept of health that it would engender, and the low costs of its implementation. Assessment of the cost-effectiveness of integrating mental health services into primary health care (PHC) would show what such a strategy costs (including its impact on other primary health care services), what it produces (in terms of increased treatment and referral rates as well as individual functioning/quality of life etc.) and whether these outcomes are worth their cost. The expectation would be that the introduction of a mental health care component will be associated with improved PHC process indicators (rates of detection, referral etc.) and patient outcomes, achieved at relatively low additional cost. Such data, almost non-existent now, would be helpful to the many governments either committed to providing effective and affordable services to their mentally ill populations.

In countries such as India and Pakistan where the preponderance of health care is privately provided and purchased, however, an important concern relates to the extent to which people with health problems actually utilise government primary health care services (Government of Pakistan, 1993, 1998; Kishore Kumar et al, 1998). Although services in the public sector in both countries are theoretically provided free or at a nominal charge, a shortage of drugs and a poorly maintained public infrastructure means that individuals mainly purchase medicines and local health care from private providers. Accordingly, a significant proportion of overall health care costs is borne privately (75% in India, 66% in Pakistan; Khattak, 1998).

This chapter describes a demonstration cost-outcome study relating to the integration of mental health services into primary health care in India and Pakistan. In so doing, it also illustrates the feasibility of undertaking economic analysis in low-income countries, and highlights important methodological and policy issues that will require consideration in the further development of mental health services in this context. The specific objectives of the demonstration project were:

- to review key issues relating to the access, provision and financing of mental health care as they relate to low-income countries;

- to develop and test protocols for the economic evaluation of community mental health programmes, based on a demonstration project in India and Pakistan;

- to generate a framework and accompanying guidelines for the conduct of mental health care economic evaluations in low-income countries.

5.2 Methods

5.2.1 Study design and selection of cases

The demonstration project was initiated by the candidate (CEMH, Institute of Psychiatry) and carried out as part of the evaluative research programmes of the Institute of Psychiatry, Rawalpindi (State of Punjab, Pakistan) and the National Institute of Mental Health and Neurosciences, Bangalore (State of Karnataka, India). Selection was based on existing networks, a proven ability to carry out required research activities and the active pursuit of a community mental health care strategy.

Study design

The chosen design of the study was to recruit and follow-up patients meeting ICD-10 diagnostic criteria for affective and neurotic disorders (WHO, 1992) from two rural catchment areas, one reflecting the standard primary health care system, and one in which mental health care had been incorporated into primary health care practice. The standard primary care centres were Jigani (Bangalore) and Lehtrar (Rawalpindi), and the centres in which mental health training and support had been given were Sakalwara (Bangalore) and Taxila (Rawalpindi). Following previous studies and methods (Mumford et al, 1997), a community survey design was adopted, involving the mapping of whole local communities and randomly selecting members of individual households. This approach enabled the health-seeking behaviour of the whole local population to be observed (rather than primary care attenders only), thereby affording the opportunity to assess the extent of unmet mental health need.

Recruitment of study participants

A two-stage process was used to recruit subjects: i) initial screening for mental disorder by trained research field workers via the Self Report Questionnaire (SRQ; Harding et al, 1980); ii) for all those scoring above the SRQ threshold for caseness (in India, a score of 5 or more indicates a probability of psychiatric morbidity, in Pakistan 6 or more), a diagnostic assessment was made by a psychiatrist (the Psychiatric Assessment Schedule or PAS; Mumford et al, 1997; in India, the Schedule for Clinical Assessment in Neuropsychiatry or SCAN; WHO, 1992). Different instruments were used because the Rawalpindi collaborators were not trained in SCAN, but both provide ICD-10 diagnoses. Only new episodes of affective and neurotic disorder were included (ICD-10 categories F32-F48), defined as the presence of a set of symptoms for which no mental health treatment had been sought in the last month. Other inclusion criteria included the age of patients (18-60 years of age) and local residence.

Those study subjects meeting diagnostic criteria were informed of their health status by the psychiatrist and were provided with information about possible treatment options, how and where to seek local treatment for their condition, and advice about psychosocial problems such as alcohol or drug dependency in their spouse.

5.2.2 Measurement and analysis of costs and outcomes

Patient measures

A range of clinical/social measures were administered via face-to-face interviews at entry into the study and again three months later, in order to observe any changes in outcomes. Data were obtained on symptomatology (Hamilton Depression Rating Scale; Hamilton, 1960), disability (Brief Disability Questionnaire; von Korff et al, 1996) and quality of life (WHOQOL Bref; WHOQOL Group, 1998). Further patient-level data were collected via the completion of a sociodemographic form (age, gender, education, employment, income) and a service utilisation form, based on the Client Sociodemographic and Service Receipt Inventory (CSSRI-EU; Chisholm et al, 1999: see Section 3.3.2; see also Appendix E).

A range of psychiatric and general medical services were identified which together were considered a comprehensive profile of services available to the populations in each locality. The main categories were: contacts with government primary health care workers (doctor, nurse, health visitor, other PHC worker); local general practitioners and indigenous healers (including *pirs* or faith healers); and (psychiatric or general medical) hospital inpatient stays and outpatient attendances. Clear definitions were attached to individual service components or categories in order to gain multi-site comparability, and space was left for inclusion of other services provided to patients that were not specifically identified in the inventory. For each service, number of contacts were requested, either in the previous one month (baseline) or over the previous three months (follow-up) and where applicable, the sector of provision (statutory/government, voluntary or private). In addition, information was obtained on individual's use of medication, support and help received from family and friends, as well as individuals' personal perceptions of providers and issues affecting access to services and attitudes towards mental health. The schedule was then refined in a similar way to the CSSRI-EU, based on discussion with principal investigators and fieldworkers in each site.

Cost measures

The perspective of the economic analysis was a societal one, such that the costs of not only the health sector were considered, but also the time costs and out-of-pocket expenses of users and their (informal) carers. This is a wider perspective than that used in the EPSILON and LIDO studies, since there was particular interest in trying to quantify the impact of common mental disorders on households and individuals, rather than on use of health services only. Unit costs were derived for a range of primary health care contacts (key workers, such as a doctor, nurse or pharmacist; other workers, such as lady health visitors; and psychiatrist), on the basis of facility-specific data on staffing levels and salaries, plus other revenue and capital costs relating to the premises at which the professionals worked. Total annual costs of professionals were divided by working days per year and hours worked per day, resulting values subsequently weighted by the ratio of time spent in/not in contact with patients. A series of other unit costs were also estimated for outpatient and inpatient hospital contacts, based on available hospital finance data.

Privately purchased health care and medications were costed as the fees that patients or their families actually paid to local providers (recorded in the service receipt schedule, and assumed to broadly reflect long-run marginal opportunity costs). Where patients or families contributed to the cost of publicly provided hospital care, this was separately quantified and subtracted from the total cost that would have applied if fully financed by government. Finally, estimates were calculated for the opportunity costs associated with informal care-giving (hours per week multiplied by an hourly wage rate for a house-maid - Indian Rupees 6; Pakistani Rupees 12), and also for time spent travelling to or waiting for care providers and lost opportunities for work (derived from the patient's estimated wage, based on gender-adjusted average earnings for labourers or skilled workers).

Analysis

The purpose, design and scale of this demonstration project precluded the conduct of a full-scale cost-consequences analysis (which would require a controlled, experimental study design, a larger sample size and a longer follow-up period). Moreover, the observational design of the study, together with differences in the structure of local health services, means that relative changes in costs and outcomes *between* catchment areas are not necessarily causally related, making *causal* inferences about cost-effectiveness based on such comparisons hazardous. (As in the EPSILON and LIDO studies, adjustment for differences in subject and site characteristics would allow for the observation of potential *associations* between localities, but that was not the principal analysis of interest in this prospective cost:outcome study.) Accordingly, the focus of analysis in this study was not on comparisons between catchment areas or sites, but on changes over time in the principle cost and outcome domains for each of the localities (using a two-sided paired-sample t-test statistic for changes in mean costs or clinical scores, and a two-tailed McNemar test for detecting statistically significant differences in changes in dichotomised variables). For assessing the impact of perceived barriers to access on the use of government health services specifically, (univariate) odds ratios were derived for a key set of factors, which were subsequently entered into a multivariate model.

5.3 Results

5.3.1 Description of sites and service systems

The organisation, delivery and financing of health care in India and Pakistan

In order to assess the feasibility of introducing a successful model of community mental health care, there is a need to understand the service systems, structures and processes that characterise mental health care and delivery in India and Pakistan. To at least the extent found in industrialised countries, fundamental problems and obstacles facing the provision of mental health services in low-income countries include:

- insufficient resourcing (especially training, drugs and basic infrastructures)
- inequitable (or non-existent) access to mental health services
- variable efficiency in the provision of services
- inadequate quality of services
- lack of co-ordination between agencies (health, social services, education etc.)

Political, administrative, geographical and socio-economic structures will also have an impact on the uptake of mental health care services in rural areas. As indicated by Table 5.1, India and Pakistan are fairly similar in terms of socio-demographic and economic indicators. The two countries share a similar structure of health financing, with services in the public sector theoretically provided free or at a nominal charge in both countries. (In Pakistan, for example, patients entering the hospital system are asked to pay one rupee per outpatient visit and five rupees per inpatient day). Overall levels of expenditure on health care in India and Pakistan amount to 6% and 3.8% respectively. In both countries less than 1% of this is spent on mental health services. Because of a lack of available drugs and a poorly maintained infrastructure, individuals often purchase medicines or treatment from a private provider, since the private or non-governmental sectors are viewed by many as providing a more efficient and effective service (Government of Pakistan, 1998). Accordingly, a significant proportion of overall health care costs is borne privately (75% in India, 66% in Pakistan; WHO, 1999).

Table 5.1 National sociodemographic and health sector characteristics

National indicators		India	Pakistan
Socio-demographic indicators			
• Population (millions)		960 million	144 million
• Populatiom growth rate (%)		2.0 %	3.0 %
• Life expectancy	Male	62 years	64 years
	Female	62 years	64 years
• Literacy rate		52 %	38 %
• GNP/capita ($)		$ 340	$ 460
Health indicators			
• Death rate/1000		10.5	9.8
• Infant mortality/1000		75	75
• Access to antenatal health services (%)		62	28
• Access to safe water (%)		?	50
• Fertility rate (%)		3.1	5.0
Health expenditure			
• Private expenditure as % total expenditure		75 %	66 %
• Health expenditure as % GDP (public sector)		2 %	0.70 %
• Health expenditure as % of GDP (all sources)		6 %	3.8 %

Source: World Health Report; WHO, 1999

In both countries, service delivery is a combination of both public and private care. In Pakistan, public health care delivery is undertaken by government hospitals, Rural Health Centres (RHC) and Basic Health Units (BHU), generally under the administrative control of the District Health Office. A programme of Lady Health Workers (LHWs), selected by the communities, trained for three months and subsequently supervised by the professional staff of BHUs and RHCs, act as a bridge between the community and the health units, generally serving a population of about 1000 individuals. The non-governmental sector provides health care to an estimated 70% of the population and includes general practitioners, small/medium-sized hospitals, maternal and child health centres and dispensaries (with outpatient primary care facilities), as well as indigenous practitioners such as homeopaths, *tabibs* and *vaids*. *Pirs* or faith healers are important agents in the local community and often act as local advisors to households on religious, economic and family matters, as well as health referral agents (Gater et al, 1991).

In India, public health care services consist of an average of one community health centre per 450,000 population, one PHC centre per 40,000 and one health sub-centre per 6,700 (World Bank, 1993b). Rural health care is supported by one local hospital located in each district headquarters. Primary health centres are usually staffed by a nurse, a pharmacist and a multi-purpose health worker. As in Pakistan, general practitioners form a major part of the total number of more than 284,000 doctors in the country. There are also independent medical practitioners, unqualified doctors, pharmacists, faith healers and traditional healers.

In terms of manpower for mental health care, there are only about 100 psychiatrists nationally in Pakistan who are concentrated in the teaching hospitals in Lahore, Rawalpindi and Karachi. There are very few trained clinical psychologists or psychiatric social workers and there is a chronic shortage of psychiatric nurses. In 1995, there were only about 3000 psychiatrists in the whole of India (a six-fold increase since 1972!) but there has not been a commensurate increase in the number of trained clinical psychologists, psychiatric social workers, psychiatric nurses or rehabilitation personnel (Srinivasa Murthy, 1996). In the countries of South East Asia (i.e. India, Pakistan, Bangladesh, Sri Lanka, Nepal and Myanmar), there was only 1 psychiatric bed for every 30,000 people, in contrast to 2-13 beds for every 1,000 people in Europe (Sartorius, 1990).

Local health service catchment areas

The sociodemographic characteristics of the four catchment areas are given in Table 5.2. Inter-site comparisons of age distributions and employment are made hard by the use of different stratifications in the two countries, but as expected the great majority fall into the categories of young adults or children, whilst the main category of employment for the adult population as a whole is 'other economically inactive' (includes household production). There is comparability of age distributions and employment categories *within* sites (i.e. between the two catchment areas of each country). There are clear differences in the percentage of adults not married, with higher rates in the Pakistan catchment areas (particularly Taxila), and also the population mortality rate (India's is nearly double that of Pakistan).

Table 5.2 Local catchment area characteristics

Sociodemographic indicator			Bangalore, India		Rawalpindi, Pakistan			
			Jigani	Sak'wara	Lehtrar		Taxila	
					M	*F*	*M*	*F*
			%	%	%	%	%	%
Age distribution								
• Children	*India (0-14)*	*Pakistan (0-18)*	40.2	41.3	25.2	30.8	24.0	29.5
• Young adults	*(15-25)*	*(19-39)*	20.4	19.9	16.2	14.8	18.6	12.4
• Older adults	*(25-59)*	*(40-65)*	31.6	31.9	7.0	4.5	7.7	6.3
• Retired	*(60+)*	*(65+)*	6.8	7.7	0.9	0.6	1.1	0.45
Employment								
• Employed			36.1	38.1	65.2	6.9	61.4	6.7
• Unemployed			0.4	0.1	22.1	10.3	24.3	10.0
• Other economically inactive			62.5	61.8	12.7	82.8	14.3	83.3
Social indicators[1]								
• % adults, not married			10.7	9.9	29.5		40.0	
• % adults, living alone			0.7	0.4	0.4		0.5	
• % adults, single parent with children			6.4	5.8	1.5		2.1	
Mortality indicators								
• Death rate/100,000			930	930	489		503	
• Death rate/100,000 under 65			/	/	385		403	

[1] adults defined as people over school leaving age

Profile of participating PHC centres

Jigani: Jigani PHC is 32km from Bangalore and the residents in this area are mostly involved in agriculture. There is a nearby industrial area which employs 3,000 individuals, 25% of whom reside in the Jigani catchment area. The PHC centre is served by 6 sub-centres, which together serve a population of 32,398, covering 95 villages over an area of 20 km^2. A single medical officer at the clinic is supported by

1 nurse, 2 health workers and five other staff. There are an average of 961 consultations per month and daily attendance is 50-140.

Sakalwara: Sakalawara is located about 15 km from Bangalore, and caters for a rural population of 5,160, which is considerably smaller than Jigani. There is one sub-centre serving this centre, which is staffed by 1 physician, 3 nurses, and five other staff. One doctor and three nurses have received additional training in mental health care, which included 3 days initial training plus 3 days follow up. The rural health centre also provides weekly clinics in the villages. Approximately 702 patients visit the centre per month.

Taxila: This site has recently been upgraded from a Rural Health Centre (RHC) and is now a 60 bedded RHC/hospital. It is served by 6 Basic Health Units (BHUs). Those who are involved in direct patient care include 6 medical officers, one female medical officer, a dentist, 2 nurses plus a radiographer, dental technician and nurse (or dispenser). Approximately 300 patients are seen a day, approximately four of which are cases of addiction and 30-50 patients have a mental disorder of some sort. Mental health training within Taxila has been underway for 18 months via a two-day workshop and two six-day courses. The number of staff who have received additional training over the last two years have been one doctor and three nurses.

Lehtrar: Lehtrar is a rural health centre set in the hills to the East of Islamabad, and has two supporting Basic Health Units. The average number of new cases per day is 36.4. Most attendees live over 30 minutes from the centre. Staff who are concerned with direct care of patients within this centre include 3 medical officers, one female medical officer, 5 dispensers, 7 dressers, 1 dentist, 1 dentist technicians and one radiographer.

The characteristics of the participating primary health care centres are summarised in Table 5.3. Three of the four centres are based in rural settings, and the other centre (Taxila, Rawalpindi) is suburban. The population of the Taxila centre's catchment area is nearly 50,000, compared to 25,000-32,000 for Lehtrar and Jigani respectively, and only 5,000 in the Sakalawara locality. Staffing levels at Taxila Rural Health Centre (RHC) are correspondingly higher, with 15 physicians and 29 other key PHC

workers, who between them see an average of 4,500 patients per month. Lehtrar RHC has 4 physicians and 13 other key PHC workers, who see 3,000 patients per month. The Bangalore PHC centres are smaller scale, with only one physician and three other key PHC workers. The caseload of both Bangalore PHC centres is below 1,000 patients per month.

In all four centres, acute illnesses/injuries represent the most common reason for patients' visits, with a particularly high proportion reported in Jigani. Definite chronic disease represented 15-27% of cases, but ill-defined chronic illness was more varied, with higher proportions evident in the Rawalpindi site (about 30%, compared to 5-10% in Bangalore). Presentation with psychological problems represented the smallest category (10% or less), except in Sakawalara where these problems constituted 30% of caseload. The age-sex distribution of the four centres was strikingly similar, with children representing the largest proportion of cases (20%), and retired /elderly people accounting for less than 5% of cases. The proportion of funds spent on salaries appears to be higher in the Pakistan PHC centres, whereas a proportionally larger amount is spent on maintenance in the Indian centres. The proportion of funding spent on drugs is fairly standard throughout. Transport to all centres is thought by the majority to be at least slightly difficult, apart from in Taxila, where the majority deemed transport to the centre to be easy.

In terms of size, population served and mean number of patients served per month, therefore, there are evident differences between the centres, which has implications for making comparisons between the catchment areas. Accordingly, analysis of costs and outcomes has focused on changes over time within the different localities, as opposed to comparisons between catchment areas or sites.

Table 5.3 Profile of participating PHC centres

PHC characteristic	Bangalore site		Rawalpindi site	
	Jigani	Sak'wara	Lehtrar	Taxila
Catchment area				
• Setting	Rural	Rural	Rural	Suburban
• Size	30 km^2	5 km^2	10 km^2	5 km^2
• Inhabitants	32,370	5,160	24,760	47,700
Staffing (full-time equivalents)				
• Physicians	1	1	4	15
• Nurses (incl. LHV)	1	3	1	9
• Health workers	2	0	12	20
• Other staff	5	5	22	54
• Physician time with patients	80 %	90 %	80 %	80 %
Funding (Rupees p.a.)	13.2 Lakh	20 Lakh	36 Lakh	29 Lakh
• Salaries	53 %	45 %	72 %	78 %
• Drugs	7 %	10 %	8 %	8 %
• Maintenance	16 %	20 %	4 %	4 %
• Other	20 %	25 %	16 %	10 %
Caseload				
• Mean no. of patients / month	961	702	3000	4500
• Average length of visit	8 mins	10 mins	10 mins	10 mins
• Reason for visits (%)				
a) Acute illnesses/injuries	65 %	45 %	37 %	37 %
b) Definite chronic disease	15 %	20 %	27 %	25 %
c) Ill-defined chronic illness	10 %	5 %	28 %	31 %
d) Psychological problems	10 %	30 %	8 %	7 %

• Age / sex distribution (%)	*M*	*F*	*M*	*F*	*M*	*F*	*M*	*F*
a) Children	25	15	25	20	18	18	18	22
b) Younger adults	15	10	10	15	12	14	11	16
c) Older adults	15	15	10	12	16	13	16	14
d) Retired/elderly	2	3	3	4	5	3	2	2

Transport to PHC centre (%)				
• Easy	36 %	40 %	10 %	60 %
• With some difficulty	30 %	35 %	50 %	20 %
• Difficult	34 %	25 %	40 %	20 %

5.3.2 Psychiatric epidemiology of catchment areas

Bangalore site: The catchment area for screening of this population for common psychiatric disorders was done in Sakalawara and Jigani, with respective populations of 1146 and 5600 individuals. These localities were systematically mapped, with each household separately identified. The screening instrument (SRQ) was administered to the available adults (aged 16 to 65 years). About 317 available adults were screened in Sakalawara area (integrated model of care) and 22.3% (or 71) persons had an SRQ score of 5 or more. Evaluation of these probable cases on SCAN revealed that 11 (15.4%) were excluded because of alcoholism, epilepsy and anaemia. The proportion of cases confirmed using SCAN was 18.9% of the adult population screened. In the Jigani locality, 478 adults were screened. 82 (17.1%) of the individuals were taken up for second stage interview (SRQ 5 and more). Evaluation revealed that 26.8% (22 individuals) could be excluded because of anaemia, pregnancy or alcoholism. The proportion of confirmed cases in Jigani area was 12.5% of the screened population of 478 people. The prevalence of diagnosable common mental disorder using samples from these localities was therefore 18.9% in Sakalawara and 12.5% in Jigani.

Rawalpindi site: 475 SRQs were administered in Lehtrar and 473 in Taxila, representing 4.5% and 2.2% of the total adult populations (aged 16 to 65 years) of the two respective catchment areas. In Lehtrar, a total of 168 subjects (35%) scored 6 or more on the SRQ (the cut-off score for the Pakistani population), whilst in Taxila the corresponding rate was 49% (232 individuals). Of these positive SRQ screens, 131 cases (78%) were given a full psychiatric assessment using the Psychiatric Assessment Schedule (PAS) in Lehtrar, and 186 (82%) in Taxila. The proportion of confirmed cases as a percentage of the screened population (i.e the prevalence of diagnosable common mental disorder) was 28% in Lehtrar and 39% in Taxila.

The various (primary) diagnoses reached for the sampled populations are given in Table 5.4. The large proportion of cases (72% in Bangalore, 92% in Rawalpindi) fall under the broad diagnostic category of mood (affective) disorders (ICD-10 code F32-F39), the remaining proportion being made up of neurotic and somatisation disorders.

The most common (primary) diagnoses in the Bangalore site were dysthymia (68% of the sample), and phobic and other anxiety disorders (19%). In contrast, only 8% of cases in Rawalpindi were diagnosed with phobic and other anxiety disorders, and there were no diagnosed cases of dysthymia. Rather, the majority of cases were diagnosed as having depressive episodes (22% mild, 32% moderate and 35% severe, of which over a third had psychotic symptoms).

Table 5.4 Diagnosis and SRQ scores

Diagnosis and SRQ score	***ICD-10 code***	**Bangalore**		**Rawalpindi**	
		N	**%**	**N**	**%**
Diagnosis (ICD-10)		(120)		(133)	
• Mild depressive episode	*F32.0*	3	2.5	29	21.8
• Moderate depressive episode	*F32.1*	1	0.8	42	31.6
• Severe depressive episode (w/o psychotic symptoms)	*F32.2*	0	0	32	24.1
• Severe depressive episode (with psychotic symptoms)	*F32.3*	0	0	19	14.3
• Dysthymia	*F34.1*	82	68.3	0	0
• Phobic and other anxiety disorders	*F40, F41*	23	19.2	11	8.3
• Other diagnosis (somatoform disorders, neurasthenia)	*F43, F45 & F48*	11	9.2	0	0
	Scale	**Mean**	**S.D.**	**Mean**	**S.D.**
Mean score at screen (SRQ) [1]	*0 - 20*	9.84	3.96	11.17	3.48

[1] T-test statistic for comparison of means = -2.830, significant at $p<0.01$

Comparison of the mean SRQ scores for the cases selected for full psychiatric assessment in the two sites revealed an important difference (Table 5.4), with subjects in Rawalpindi (mean = 11.17, S.D. 3.48) scoring on average 1.32 points higher than subjects in Bangalore (mean = 9.84, S.D. 3.96). This difference was found to be statistically significant, which suggests that the Rawalpindi population somatised distress more than their Indian counterparts.

5.3.3 Sociodemographic characteristics of the sampled population

The sociodemographic characteristics of the sampled populations in each of the four catchment areas of the study are given in Table 5.5. There are a number of broad similarities across the catchment areas, including the preponderance of women (71-87% of the samples), the proportion of married people (62-80%), and the small minority who are currently employed (2-13%). There are also clear differences between and within sites, however, such as the age distribution (for example, 50% of subjects in Lehtrar were aged 45 years or more, compared to only 13% in Taxila), the range of monthly incomes and the extent of educational achievement.

Table 5.5 Baseline sociodemographic characteristics

Sociodemographic variable		Bangalore, India				Rawalpindi, Pakistan			
		Standard care (Jigani)		Integrated care (Sakalwara)		Standard care (Lehtrar)		Integrated care (Taxila)	
		N	%	N	%	N	%	N	%
Gender	Male	13	21.7	16	26.7	20	28.6	8	12.7
	Female	47	78.3	44	73.3	50	71.4	55	87.3
Age (years)	16-30	28	46.7	17	28.3	15	21.4	26	41.3
	31-45	19	31.7	20	33.3	19	27.1	29	46.0
	45-60	13	21.7	23	38.3	36	51.4	8	12.7
Marital status	Single	7	11.7	3	5.0	9	12.9	17	27.0
	Married	42	70.0	48	80.0	49	70.0	39	61.9
	No longer	10	18.3	9	15.0	12	17.1	7	11.1
Children	None	13	21.7	9	15.0	14	20.0	21	33.3
	1-3	29	48.3	26	43.3	18	25.7	10	15.9
	4 or more	18	30.0	25	41.7	38	54.3	32	50.8
Employment	Employed	6	10.0	8	13.3	8	11.4	1	1.6
	Unemploy	21	36.0	26	43.3	13	18.6	20	31.7
	Housewife	33	54.0	26	43.3	49	70.0	42	66.7
Income[1] (monthly)	< Rs 2000	41	68.3	51	85.0	50	71.4	19	30.2
	Rs 2-5000	19	31.7	8	13.3	17	24.3	36	57.1
	> Rs 5000	0	0	1	1.7	3	4.3	8	12.7
Education (completed)	< Primary	34	56.7	50	83.3	21	30.0	13	20.6
	Primary	11	18.3	4	6.7	8	11.4	12	19.0
	Secondary	15	25.0	6	10.0	15	21.4	18	28.6
	Missing	0	0	0	0	26	37.1	20	31.7

[1] Expressed as gross personal income in local currencies (not adjusted)

5.3.4 Rates of contact with services

In the standard care locality in the Bangalore site (Jigani), 17% had contacted a government primary care provider in the one month preceding baseline assessment, 33% had consulted a private provider in the community, 10% had had an hospital outpatient attendance and 5% had been admitted as a hospital inpatient (Table 5.6). In the integrated care locality (Sakawalara), 37% of the population had been in contact with a government primary care provider, 25% had contacted a private community-based provider, 7% had had an outpatient attendance and 3% had used inpatient facilities. The higher rate of contact with primary health care in the integrated care locality is maintained at the three month follow-up assessment point (43%, compared to 25% in Jigani). Users in the standard care locality of Jigani appear to have utilised hospital outpatient services more than primary care as a result of their diagnosed condition, reflected by an increase in attendance rates. Most significantly for this site, only 25% in Jigani and 43% in Sakalawara actually sought care from a government primary care provider (and only 55% and 65% for *any* contact in the two respective areas), even after being informed of their clinical condition and advised to seek care.

Trends in service use were different in the Rawalpindi site. Two-thirds of subjects at baseline had had contact with a government primary care worker in the non-integrated site (Lehtrar), compared to a quarter of subjects in the integrated locality (Taxila). After three months, the contact rates with government primary care providers rose to 88% and 52% respectively, both considerable increases of more than 20% (McNemar test for significant differences: $p<0.05$). In other aspects of health care seeking, in both sites approximately two-thirds of subjects had consulted a private community provider at baseline, one-third had had an outpatient attendance, and 2-7% had been admitted to hospital. Whereas there were only modest changes to these contact rates in the standard care locality of Lehtrar (except an 11% increase in admission rates), there were marked and statistically significant increases in the extent to which subjects in the integratred care locality of Taxila utilised services (changes of over 20%). There were also significant increases in the proportion of cases in contact with any type of service (from 86% to 100% in Lehtrar, and 75% to 97% in Taxila).

Table 5.6 Rate of contact with primary and secondary health care services

Rate of contact (% Yes)	Bangalore, India						Rawalpindi, Pakistan					
	Jigani (N = 60) (standard care locality)			*Sakalawara (N = 60) (integrated care locality)*			*Lehtrar (N = 67) (standard care locality)*			*Taxila (N = 63) (integrated care locality)*		
	Baseline (%)	Follow up (%)	Change (%)	Baseline (%)	Follow up (%)	Change (%)	Baseline (%)	Follow up (%)	Change (%)	Baseline (%)	Follow up (%)	Change (%)
Government PHC worker *(doctor, nurse, health worker)*	17	25	+ 8	37	43	+ 6	67	88	**+ 21**	27	52	**+ 25**
Private community *(traditional or faith healer)*	33	27	- 6	25	25	0	61	66	+ 5	60	82	**+ 22**
Hospital outpatient *(psychiatric & general)*	10	18	+ 8	7	5	- 2	27	22	- 5	33	56	**+ 23**
Hospital inpatient *(psychiatric & general)*	5	0	- 5	3	5	+ 2	7	18	+ 11	2	5	+ 3
Any service contact	48	55	+ 7	60	65	+ 5	86	100	**+ 14**	75	97	**+ 22**

Note: Results in **bold** are statistically significant changes over time ($p<0.05$), using McNemar Test (2-tailed)

5.3.5 Access to services

It is important to observe that use of services to mitigate distress is a complex phenomenon. In other words, differential patterns of use may not only be related to severity of distress, but also to distance from the agency; affordability of treatment, awareness about the change intervention can bring about, etc.. As well as obtaining data on clinical outcomes and service utilisation, therefore, information was also sought on the health-seeking behaviour and *perceptions of care* of the sampled population, in order to explore issues around access to services. A series of potential barriers or impediments to appropriate care and treatment were presented to the sampled populations (see Appendix 5A).

Barriers to access

Key factors affecting use of services at baseline assessment in both the Bangalore localities included cost of care (37% in Jigani, 22% in Sakawalara), feelings of embarrassment (20% and 30% respectively), and the perception that care if sought would not be effective (25% and 18% respectively) (Table 5.7). Significant reductions occurred after three months with regard to the perceived cost of care in both localities (27% and 17% less), and with regard to embarrassment in the integrated site (22% less). In the Rawalpindi sites a high proportion of cases agreed that the presented reasons were a constraint on their uptake of services – in Lehtrar, distance (81%), affordability (76%) and medical side effects (60%) were the main barriers to access at baseline and a large proportion also felt embarrassment was a constraint on their uptake of services (49%). For all factors, there were reductions in the proportion who viewed the presented reasons as barriers to access, with statistically significant differences in perceptions with regard to the inconvenience of services (-23%), the expense of services (-30%), stigma attached to seeking care (-30%) and perceptions regarding the ineffectiveness of services (-16%). In Taxila, the cost of services (46%) and a belief that services will be ineffective (37%) seemed to be initial constraints to use. There is very little change over time in this locality. A significant change is noted with regard to other reasons affecting seeking care, which included being depressed, the unavailability of medicines and dislike of a hospital environment.

Table 5.7 Barriers to access and preferred provider

	Bangalore, India						Rawalpindi, Pakistan					
	Jigani (N = 60) (standard care locality)			*Sakalawara (N = 60) (integrated care locality)*			*Lehtrar (N = 67) (standard care locality)*			*Taxila (N = 63) (integrated care locality)*		
	Baseline (%)	Follow up (%)	Change[3] (%)	Baseline (%)	Follow up (%)	Change[3] (%)	Baseline (%)	Follow up (%)	Change[3] (%)	Baseline (%)	Follow up (%)	Change[3] (%)
Barrier to access (% Yes)												
A Inconvenient / too far / no time	8	2	- 6	13	12	- 1	81	58	**- 23**	25	24	- 1
B Unaffordable / too costly	37	10	**- 27**	22	5	**- 17**	76	46	**- 30**	46	49	+ 3
C Embarrassed to seek care	20	8	- 12	30	8	**- 22**	49	19	**- 30**	11	3	- 8
D Family discouragement	10	10	0	13	5	- 8	10	5	- 5	5	5	0
E Medication side-effects[1]	3	5	+ 2	12	10	- 2	60	52	- 8	11	6	- 5
F Treatment seen as no use	25	13	- 12	18	15	- 3	29	13	**- 16**	37	36	- 1
G Other reason[2]	11	2	- 9	9	3	- 6	0	0	0	9	0	**- 9**
Preferred provider (%)												
A Public provider	48	65	**+ 17**	72	75	+ 3	73	83	+ 10	41	48	+ 7
B Private provider	48	35	- 13	24	23	- 1	27	13	**- 14**	54	52	- 2
C Indifferent (between public / private)	3	0	- 3	3	2	- 1	0	4	+ 4	5	0	- 5

Notes:

[1] includes aversion to injections;
[2] includes being depressed / incapacitated, unavailability of medications and dislike of hospital environment;
[3] results in **bold** are statistically significant reductions over time ($p<0.05$), using McNemar Test (2-tailed)

Preferred provider

Individuals were asked to indicate whether they preferred a public or private provider and to give reasons for their choice (Table 5.7). In the Bangalore site, there is a preference for a public provider in Sakalawara (72%) whereas in Jigani preference is equally divided. At the follow-up assessment, there is little observed change in Sakawalara but in Jigani there is a clear and statistically significant shift towards preferring to consult a public provider. There is a similar pattern of change in the Rawalpindi site, with little observed change in the choice of provider in Taxila (where preference is equally provided), compared to a significant shift away from the private to the public sector in the Lehtrar catchment area (preference for a private provider drops from 27% to 13%).

Impact of perceived barriers to access on use of government health services

For each site, the sampled populations of both catchment areas were pooled and split according to whether they had used government health services or not (defined as at least one contact with government primary or secondary care), in order to assess the potential influence of key sociodemographic, clinical and access variables on this service uptake (Table 5.8). In the Bangalore site, men were more likely to have used government services (multivariate odds ratio = 3.53; 95% CI 1.06, 11.7), as were employed individuals (OR = 9.98; 95% CI 1.87, 53.2). Of the access variables, embarrassment and/or family discouragement was associated with reduced use of government services (OR = 0.13; 95% CI 0.02, 0.75). In the Rawalpindi site, the only statistically significant association in the multivariate model relating to the use of government services was the perception that treatment was of poor quality or would lead to side-effects (OR = 4.76, 95% CI 1.55, 11.7).

Table 5.8 Associations (odds ratios) between barriers to access and use of government primary and secondary care [1]

	Bangalore, India						Rawalpindi, Pakistan					
	Univariate Odds Ratios			Multivariate Odds Ratios			Univariate Odds Ratios			Multivariate Odds Ratios		
	OR	95% CI		OR [2]	95% CI		OR	95% CI		OR [2]	95% CI	
Sociodemographic characteristics												
Gender (1 = male)	1.16	0.50	2.71	**3.53**	1.06	11.7	1.43	0.56	3.66	1.79	0.54	5.92
Marital status (1 = married)	0.73	0.32	1.67	0.63	0.25	1.60	1.89	0.83	4.30	1.88	0.75	4.72
Employment status (1 = employed)	3.66	1.08	12.4	**9.98**	1.87	53.2	2.55	0.31	21.2	3.12	0.27	35.7
Clinical scores												
Depression score (1 = improvement)	2.06	0.78	5.46	2.89	0.95	8.74	2.41	1.04	5.55	2.54	0.83	7.82
Disability score (1 = improvement)	1.24	0.51	3.04	0.70	0.24	2.00	1.33	0.59	3.00	0.80	0.27	2.37
Barriers *(letters relate to Table 3)*												
1. Cost/distance (A + B)	1.55	0.49	4.91	2.64	0.64	10.82	3.03	1.31	6.95	2.01	0.77	5.23
2. Embarrassed/discouraged (C + D)	0.34	0.09	1.31	**0.13**	0.02	0.75	1.26	0.39	4.08	0.78	0.21	2.96
3. Poor treatment/side-effects (E-G)	0.81	0.31	2.17	1.36	0.37	5.03	3.86	1.53	9.75	**4.26**	1.55	11.75
N, df					120	8					133	8
% correct: no, yes					86	45					19	96
Log-likelihood, Chi-square, Sig				146.8	17.85	0.022				123.0	21.40	0.006

Notes:

[1] Users defined as all subjects who had at least one contact with government primary or secondary care services; non-users had no contact with these services

[2] results in **bold** are statistically significant associations ($p<0.05$)

Costs of common mental disorders

Health care costs

Whilst there were considerable variations in cost between sampled individuals within particular localities, a number of general trends emerge from the cost analysis (Table 5.9). The mean cost of contacts with government primary health care workers, which would be expected to rise if individuals seek appropriate treatment for their diagnosed mental health condition, does in fact increase in the localities where mental health care training and support has been introduced (Sakalwara and Taxila), whereas there is very little change in the standard care localities. By contrast, costs of contacts with community-based private health care providers (general practitioners, traditional healers) drops in all localities, significantly so except in the Sakalwara locality. Privately incurred expenditures on medication, on the other hand, remain relatively constant over the three month period. Aggregated health care costs increase, but not statistically significantly so, in both integrated care localities, resulting mainly from increased contact with secondary care services.

Total societal costs

The opportunity costs associated with lost work, time and travel to obtain treatment and informal caregiving by family members were also estimated (Table 5.9). Costs of lost work days decreased significantly in all localities, particularly in the Bangalore site where costs fell by 80-90%. Opportunity costs associated with informal care-giving (help from relatives in or outside the home such as child care, cooking and shopping) decrease in the Bangalore site also, but rise considerably in the Rawalpindi site, notably in Taxila. When all costs are combined (health care and patient/family costs), the magnitude of the economic impact of depression and anxiety becomes evident: in the Bangalore site, the cost at baseline is Indian Rupees 700 per month, and in the Rawalpindi site the baseline cost is in excess of Pakistani Rupees 3000 per month. To put this in context, this is equivalent to between 7-14 days of an agricultural worker's wages in India, and approximately 20 days in Pakistan. These total costs, however, fall appreciably by the follow-up assessment point in all localities except Taxila, where there is a significant increase.

Table 5.9 Health care and patient/family costs at baseline and follow-up: a) Bangalore, India; b) Rawalpindi, Pakistan

A. Bangalore site *(Indian Rupees per month, 1998)*	**Standard model - Jigani (N=60)** Baseline *Mean (SD)*	Follow-up *Mean (SD)*	*Change (95% CI)*	**Integrated model - Sakalawara (N=60)** Baseline *Mean (SD)*	Follow-up *Mean (SD)*	*Change (95% CI)*
Health care costs						
• Primary health care (government)	10 (31)	9 (23)	- 1 (-8; 11)	19 (38)	42 (154)	23 (18; 63)
• Primary / community care (private)	103 (249)	12 (30)	- 91 (-155; -27) *	77 (418)	67 (488)	- 10 (-153; 173)
• Hospital care (government)	5 (36)	39 (122)	35 (1; 68) *	8 (42)	127 (930)	119 (-122; 360)
• Hospital care (private)	61 (243)	15 (59)	- 46 (-111; 19)	22 (99)	50 (276)	28 (-41; 98)
• Medicines (privately paid)	55 (115)	28 (61)	- 27 (-61; 6)	33 (87)	41 (196)	8 (-37; 53)
Sub-total	234 (454)	103 (148)	- 131 (-260; -2) *	159 (516)	328 (1192)	169 (-149; 487)
Patient and family costs						
• Informal care-giving	144 (232)	78 (199)	- 67 (-145; 12)	148 (259)	65 (122)	- 83 (-155; -10) *
• Travel and time costs	73 (298)	4 (15)	- 69 (-146; 8)	31 (85)	11 (47)	- 20 (-42; 3)
• Lost work opportunities	260 (554)	53 (171)	- 207 (-327; -86) **	363 (590)	44 (122)	- 319 (-476; -162) **
Total costs	711 (984)	237 (360)	- 474 (-730; -217) **	701 (791)	448 (1292)	- 253 (-604; 97)
B. Rawalpindi site *(Pakistani Rupees per month, 1998)*	**Standard model - Lehtrar (N=67)** Baseline *Mean (SD)*	Follow-up *Mean (SD)*	*Change (95% CI)*	**Integrated model - Taxila (N=63)** Baseline *Mean (SD)*	Follow-up *Mean (SD)*	*Change (95% CI)*
Health care costs						
• Primary health care (government)	90 (133)	81 (62)	- 10 (-34; -15)	10 (24)	23 (36)	13 (2; 23) *
• Primary / community care (private)	108 (164)	47 (69)	- 61 (-102; -20) *	134 (218)	80 (121)	- 54 (-106; -2) *
• Hospital care (government)	180 (454)	299 (691)	119 (-76; 314)	59 (167)	215 (376)	156 (62; 249) **
• Hospital care (private)	41 (136)	49 (134)	8 (-22; 38)	53 (155)	289 (858)	236 (16; 455) *
• Medicines (privately paid)	137 (164)	119 (99)	- 18 (-58; 23)	392 (1201)	400 (747)	7 (-338; 353)
Sub-total	562 (784)	610 (799)	48 (-194; 291)	650 (1303)	1020 (1557)	370 (-134; 874)
Patient and family costs						
• Informal care-giving	1186 (1341)	1486 (1249)	300 (-101; 701)	1170 (1060)	3026 (1398)	1855 (1449; 2261) **
• Travel and time costs	581 (1092)	146 (184)	- 435 (-684; -186) **	130 (197)	145 (210)	15 (-52; 83)
• Lost work opportunities	739 (709)	250 (190)	- 489 (-668; 315) **	1151 (1149)	614 (759)	- 537 (-816; -258) **
Total cost	3084 (2760)	2405 (1615)	- 678 (-1358; 2) **	3107 (2365)	4807 (2540)	1700 (973; 2425) **

* $p < 0.05$ (2-sided paired t-test); ** $p < 0.01$

For information: Exchange rates @ 1/1/1999: £1 = Indian Rupees 70; Pakistani Rupees 82

5.3.6 Outcome assessments

Baseline depression scores were markedly higher in the Rawalpindi site, indicative of greater psychiatric morbidity. However, since the interviewers were not trained simultaneously or by the same trainer, it is conceivable that rating methods differed in the two sites. Results are therefore couched in terms of changes in scores over time in the two separate sites (Table 5.10). Overall, there were improvements in quality of life, and significant reductions in symptomatology and disability. In three of the four localities, there was a substantial reduction in depression symptom levels (between 5.1 and 8.6 points lower, each statistically significant at $p<0.01$). The exception was Taxila, where there is only a very modest reduction (0.5 points). Results for the BDQ closely reflect those for depression scores, in the sense that in all localities bar Taxila there is a significant reduction in overall disability score (6.2 to 7.9 points less). There is a slight, though not statistically significant, *increase* in BDQ score for Taxila (0.3 points higher). There were statistically significant improvements in quality of life scores in Sakalawara and Lehtrar, only modest improvements in Jigani and in Taxila there was no clear change either way.

Summary of change scores for key cost and outcome domains

A summary of observed changes over time in the principle cost and outcome domains is given in Table 5.11, including a comparison of change scores between those who had been in contact with government primary and secondary health care and those who had only consulted local practitioners or not accessed care at all. For both localities in the Bangalore site, there are higher service costs but greater improvements in depression score. Improvements in disability change scores are also better among government health care users. There are no statisitically significant differences in change scores in the Rawalpindi site, but again service costs are higher among government health care users. Depression and disability change scores are actually better among the (very small number of) non-users in the Lehtrar locality, and in Taxila users of government health care services had a marginally better depression mean change score but slightly worse disability score. In the two integrated care localities, therefore, there are no clear advantages in clinical or economic outcomes for users of government primary and secondary care services.

Table 5.10 Outcome measurement results

A. Bangalore site	**Standard model - Jigani (N=60)**			**Integrated model - Sakalawara (N=60)**		
	Baseline	Follow-up		Baseline	Follow-up	
	Mean (SD)	*Mean (SD)*	*Change (95% CI)*	*Mean (SD)*	*Mean (SD)*	*Change (95% CI)*
Hamilton Depression Scale (HDRS)	11.27 (7.00)	4.43 (4.30)	-6.83 (-4.80;-8.86) **	10.70 (5.62)	5.60 (4.51)	-5.10 (-3.43;-6.77) **
Brief Disability Questionnaire (BDQ)	7.42 (3.49)	3.28 (4.18)	-4.13 (-2.80;-5.47) **	8.45 (4.66)	3.10 (3.46)	-5.35 (-3.99;-6.71) **
• Days unable to carry out activities	2.40 (4.57)	1.03 (3.09)	-1.37 (-0.12;-2.61) *	3.53 (7.40)	0.67 (1.96)	-2.87 (-0.93;-4.80) **
• Days spent in bed due to illness	0.65 (1.36)	0.47 (1.52)	-0.18 (-0.69;0.32)	1.58 (5.03)	0.22 (0.78)	-1.37 (-0.04;-2.69) *
WHOQOL Bref						
• Domain 1 (physical health)	13.88 (2.84)	14.29 (2.58)	0.40 (-0.41;1.22)	13.09 (3.14)	14.08 (2.14)	0.99 (0.26;1.72) *
• Domain 2 (psychological)	12.91 (2.97)	13.75 (2.68)	0.85 (0.04;1.65) *	12.69 (3.20)	13.86 (2.53)	1.17 (0.42;1.92) **
• Domain 3 (social relationships)	13.43 (3.25)	13.76 (2.74)	0.33 (-0.62;1.29)	13.20 (3.14)	13.61 (2.43)	0.41 (-0.37;1.19)
• Domain 4 (environment)	14.32 (2.12)	14.36 (1.97)	0.04 (-0.54;0.62)	12.33 (2.45)	13.47 (2.15)	1.13 (0.58;1.68) **
B. Rawalpindi site	**Standard model - Lehtrar (N=67)**			**Integrated model - Taxila (N=63)**		
	Baseline	Follow-up		Baseline	Follow-up	
	Mean (SD)	*Mean (SD)*	*Change (95% CI)*	*Mean (SD)*	*Mean (SD)*	*Change (95% CI)*
Hamilton Depression Scale (HDRS)	29.36 (4.89)	20.72 (5.12)	-8.64 (-10.19;-7.10) **	21.89 (6.91)	21.38 (5.82)	-0.51 (-1.82;0.80)
Brief Disability Questionnaire (BDQ)	16.93 (3.91)	12.18 (4.47)	-4.75 (-6.18;-3.31) **	7.48 (3.81)	7.78 (3.73)	0.30 (-0.37;0.98)
• Days unable to carry out activities	5.27 (6.23)	4.24 (2.76)	-1.03 (-2.64;0.58)	6.44 (7.53)	10.84 (11.04)	4.40 (1.57;7.23) **
• Days spent in bed due to illness	3.12 (4.84)	1.84 (2.25)	-1.28 (-2.58;0.01) *	3.03 (5.44)	6.05 (8.52)	3.02 (0.90;5.14) **
WHOQOL Bref						
• Domain 1 (physical health)	10.43 (1.79)	12.10 (1.55)	1.67 (1.18;2.16) **	11.92 (2.15)	11.88 (1.91)	-0.04 (-0.44;0.36)
• Domain 2 (psychological)	10.84 (1.60)	12.79 (1.90)	1.95 (1.52;2.38) **	11.82 (1.99)	11.97 (1.71)	0.15 (-0.22;0.52)
• Domain 3 (social relationships)	12.50 (2.22)	14.03 (1.95)	1.53 (0.94;2.12) **	12.11 (2.25)	12.00 (1.85)	-0.11 (-0.57;0.36)
• Domain 4 (environment)	10.74 (2.31)	12.89 (1.89)	2.15 (1.50;2.80) **	11.13 (2.17)	11.35 (2.08)	0.21 (-0.12;0.55)

* $p < 0.05$ (2-sided paired t-test); ** $p < 0.01$

Table 5.11 Summary of changes in cost and outcome

Change score	All subjects		Users *		Non-users *		Difference (users vs non-users)	
	Mean change	*SD*	*Mean change*	*SD*	*Mean change*	*SD*	*Mean*	*95% CI*
Jigani	(N=60)		(N=24)		(N=36)			
(standard care)								
Service costs	- R 131	501	+ R 78	347	- R 271	542	R 348	-598 ; -98
Family costs	- R 342	652	- R 407	710	- R 245	553	R 162	-505 ; 182
Depression (HDRS)	-6.83	7.9	-9.79	8.05	-4.86	7.18	4.93	0.95 ; 8.91
Disability (BDQ)	-4.13	5.2	-4.17	5.60	-4.11	4.93	0.06	-2.80 ; 2.69
Sakalwara	(N=60)		(N=31)		(N=29)			
(integrated care)								
Service costs	+R 169	1230	+R 366	1324	- R 15	1126	R 381	-1015 ; 253
Family costs	- R 422	685	- R 392	705	- R 450	678	R 58	-415 ; 299
Depression (HDRS)	-5.10	6.5	-5.66	7.47	-4.58	5.47	1.07	-2.29 ; 4.44
Disability (BDQ)	-5.35	5.3	-6.10	4.90	-4.65	5.59	1.46	-1.27 ; 4.18
Lehtrar	(N=67)		(N=59)		(N=8)			
(standard care)								
Service costs	+ R 48	996	+ R 70	1060	- R 111	132	R 181	-935 ; 573
Family costs	- R 634	2294	- R 626	2394	- R 689	1524	R 62	-1809 ; 1684
Depression (HDRS)	-8.64	6.34	-8.42	6.35	-10.25	6.41	1.83	-6.61 ; 2.96
Disability (BDQ)	-4.75	5.90	-4.73	5.99	-4.88	5.54	0.15	-4.62 ; 4.32
Taxila	(N=63)		(N=20)		(N=43)			
(integrated care)								
Service costs	+R 370	1984	+R 666	2300	- R 299	567	R 965	-2040 ; 108
Family costs	+R 1297	1981	+R 1293	2046	+R 1304	1889	R 11	-1074 ; 1096
Depression (HDRS)	-0.51	5.21	-0.81	5.73	+ 0.15	3.90	0.96	-1.87 ; 3.79
Disability (BDQ)	+0.30	2.69	+0.56	2.72	-0.25	2.59	0.81	-2.26 ; 0.64

* Users defined as all subjects who had at least one contact with government primary or secondary care services; non-users had no contact with these services

5.4 Discussion

Feasibility of economic analysis of mental health care in low-income countries

Against the backdrop of a widening recognition of the public health burden of psychiatric disorders, this demonstration study set out to develop and test methods for conducting economic analysis of community mental health programmes in low-income countries. Such evaluative techniques, if appropriate and feasible to employ, enable the generation of data on the relative costs and benefits of a range of responses to psychiatric disorder in the community, which can subsequently inform policy discussion and service development. On the basis of this demonstration project, it is possible to conclude that economic analysis in low-income countries is both feasible and practicable. In reaching this conclusion, however, it is important to be cognisant of a number of factors that have contributed to the successful conduct of this particular study, including the research and training capacity of the collaborating institutions, the interest shown in incorporating economic perspectives into existing evaluative programmes, and the professionalism of key workers. We are nevertheless confident that other centres in low-income countries who possess a grounding in research methodology and an interest in addressing issues of cost-effectiveness will be able to carry out economic analysis alongside their other activities. Towards this end, a brief set of guidelines have been prepared (Appendix F), which are aimed at providing a set of principles and procedures that need to be pursued in order to carry out an economic evaluation of a mental health care intervention in this context.

The economic burden of common mental disorders

The health care and other patient/family opportunity costs incurred by sampled individuals with a diagnosed common mental disorder were considerable. It is important to note that the preponderance of these costs were privately incurred expenditures, and that a significant category of health care cost was consultations with local general or traditional practitioners (neither of whom are trained or qualified to detect or treat psychiatric morbidity). Thus, whilst individuals (and

households) are seeking help, and spending significant amounts of money in the process, they are not in the main receiving appropriate care for their mental health condition. The imputed costs associated with reported levels of informal care-giving, travelling time/expenses and lost days of work are also very considerable, and in fact exceed formal health care costs by a factor of as much as three (a finding echoed in other cost of illness studies for depression and other affective disorders carried out in industrialised countries; Kind and Sorensen, 1993; Greenberg et al, 1993). Although self-reported estimates of specific care-giving activities such as 'help around the home' are subject to reliability constraints (typically leading to overestimation of opportunity cost), use of clearly specified activities and minimal wage rates for a house maid/servant nevertheless help to demonstrate the economic impact of common mental disorder on the productive opportunities of individuals and families.

Strengths and limitations of the study

An important feature of the chosen study design was that it enabled estimation of the prevalence of common mental disorders in the sampled catchment areas. This study reinforces the findings of earlier epidemiological studies in each site that common mental disorders are indeed common, particularly among women (an estimated 12-18% of the adult populations of the Bangalore catchment areas, and 28-39% in the Rawalpindi site). Although there are notable differences in the diagnostic profiles of the two sites (high rates of moderate and severe depressive episodes in the Rawalpindi site, and a high prevalence of dysthymia in the Bangalore site), which are potentially a function of our use of different schedules, the focus of this study was on analysis of health care seeking patterns within rather than between sites, and our results in fact closely reflect those reported locally in other recent studies (Mumford et al, 1997; Ustün and Sartorius, 1995). The observational study design also enabled assessment of the health-seeking behaviours of whole catchment populations, which demonstrated the economic consequences associated with unmet need at the level of individuals, families and local health services. For example, it was found that only just over half of the sampled populations in the Bangalore site had contacted services at all, and an even smaller proportion were in contact with government primary health care workers.

The high proportion of subjects who did not access government primary health care services in the two localities where mental health care had been integrated confounded assessment of the relative cost-effectiveness of the programme at the catchment area level (only about half of subjects were exposed to the PHC-based intervention). An experimental study design involving the comparison of attenders only at primary care centres with and without the integrated care model is required to satisfactorily address this question. Comparison between those who did and did not access government primary and secondary services in the integrated care localities, however, showed no statistically significant advantages in clinical or economic outcomes for the former sub-group. In particular, the recent introduction of mental health training and support in the main primary health care centre in Taxila does not yet appear to have benefited the sampled mentally ill population of that area (a plausible reason for this is that there was a strong preference for, and consequent reliance on, private care providers in this population).

A striking finding of the study is the significant improvement in the outcome domains of depression, disability and quality of life for both standard care localities. These results may represent a regression to the mean or be partly explained by spontaneous remission or improvement, particularly in the Rawalpindi site where there was a significant proportion of acutely depressed cases, but also suggest that interviewing individuals about their mental health state, and advising them to seek care locally, may exert an intervention effect itself.

Factors affecting access to and uptake of services

The findings of this component of the research, which focused on the inter-linked processes of access to appropriate care, perceptions about local health providers and actual utilisation of services, demonstrate that the successful implementation of a community mental health care programme is contingent on the health-seeking behaviours of both the local population at large and the specific target groups for whom the intervention is intended. Most notably, it is clearly apparent that only a modest proportion of sampled subjects use government-provided primary health care services. This confirms the findings of other recent research into health-seeking

behaviours in these countries (Government of Pakistan, 1998; Noorali et al, 1999; Regimi et al, 1999; Kishore Kumar et al, 1998). In the two localities where mental health care had been integrated into primary care, for example, the proportions who had used such a service in the month preceding baseline were 27% in Taxila (Rawalpindi) and 37% in Sakawalara (Bangalore). Although rates of contact improved over the course of the study (to about 50%), an obvious implication of this finding is that approximately one half of subjects *did not* access government primary health care, thereby rendering themselves unable to benefit from mental health care and treatment available at the two integrated primary health care centres.

A further striking finding of the study is the impact that the process of identification and referral of cases of common mental disorder had in the different care localities. It is apparent that there was a discernible shift in the health-seeking behaviour of the standard care localities in both sites, particularly so in Lehtrar, reflected by an increase in the perceived access to, preference for and use of government primary care services. The positive shift in Lehtrar can be explained in part by the appointment of a lady doctor preceding the study period (contact rates have since decreased dramatically following her departure). By contrast, attitudes towards local health services and providers in the integrated locality of that site (Taxila) were more ambivalent and changed very little over time, manifesting itself in increased rates of contact with private as well as public providers. In Sakawalara, where mental health care has long been integrated into primary care, contact rates and choice of provider remained more stable.

What these findings suggest is that changes in perceived access to care, preferred provider and actual use of services are largely independent of the introduction of mental health training and support into government primary care facilities. A more plausible explanation is that interaction with mental health researchers (as a result of face-to-face research interviews) has had an influence on subjects' perceptions of service access and provision. Furthermore, improvements in depressive symptoms (through natural remission or successful treatment) and functioning are likely to have played their part in forming preferences about the quality and value of local health care services. Formal testing of these and other possible inter-relationships has been

limited to a logistic regression of factors that are associated with the uptake of government services, which indicated that it is socio-demographic characteristics and individual perceptions about health services, rather than improvements in depression or disability *per se*, that may have the more important bearing on treatment choice.

Future policy priorities and research needs

The most pressing policy priority in low-income countries is to enhance the recognition of common mental disorders as a public health concern, not only through epidemiological, clinical, economic and social research, but through the dissemination of that evidence to decision-makers at all levels of federal and local government. Increased provision of appropriate care and resources for common and more severe psychiatric disorders cannot be expected to occur without a corresponding improvement in the awareness and understanding of key decision-makers. An important aspect of this awareness-raising campaign, already under way as part of the Nations for Mental Health initiative (Jenkins, 1997b), is the reduction of stigma towards mental illness, both at a policy and public level. Indeed, it would appear that efforts to make basic mental health *care* more widely available through integration with primary health care need to be accompanied by mental health *promotion* activities in order to increase awareness and reduce stigma about mental illness, as well as to communicate the availability of good quality, low-cost and effective treatment. Such promotional activities, through schools programmes or other campaigns, have high preventive value and are virtually bound to be cost-effective (Rahman et al, 1998).

Since governments of low-income countries are fundamentally constrained by lack of resources, constructive ways of harnessing existing local resources must be given consideration, not only in terms of integrating mental health care into the primary care system but also in terms of engaging other professionals and leaders. In many cases the first 'port of call' for an individual with mental disorder (or a member of their household) is the traditional or general practitioner. Simple mental health training for these local private providers might represent an effective means of improving the detection, referral and management of common psychiatric disorders.

Of particular relevance in this respect is the currently widespread prescription of inappropriate medications by local private practitioners for these disorders, the cost of which is invariably met by the patient or family. Training in the detection and treatability of common psychiatric disorders needs to be accompanied by the availability of suitable drugs (and simple psychosocial interventions). Whilst the high acquisition cost of newer anti-depressants is an obvious constraint, conventional tricyclics are very cheap and equally effective (if not quite as well tolerated). And yet in many of the pharmacies visited in the present study, such medication is not stocked or available. The establishment and implementation of an essential drug list for psychiatric disorders is likely to represent a further policy consideration in many low-income countries.

Finally, whilst the current study has generated data on the service utilisation patterns and costs of individuals with a diagnosed common mental disorder among two catchment area populations in India and Pakistan, there remains a chronic shortage of economic data to support mental health policy or resource allocation discussions at a national or international level. There is consequently a need to undertake further studies that not only address the relative cost-effectiveness of alternative interventions or strategies (using a prospective, experimental design), but also broaden our understanding of the inter-relationship between psychiatric morbidity and disability on the one hand, and access to and uptake of services on the other. Indeed, interventions for common psychiatric disorders need to be carefully planned in accordance with the prevailing health-seeking behaviours of the local population(s) as well as other demographic, cultural and socio-economic factors, since these factors are likely to contribute significantly to their overall effectiveness and cost-effectiveness.

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6. Discussion, conclusions and policy implications

On the basis of the three preceding research studies, each with a common interest in the cross-cultural assessment of mental health services and associated costs, this research thesis set out to illustrate the development, application and promotion of methods for economic analysis relevant to multinational mental health services research and policy. These intentions were framed in the context of, on the one hand, the prevalent and highly disabling nature of psychiatric disorders globally, and on the other hand, the low priority and meagre level of investment accorded to the provision of services for these disorders in many parts of the world. The end goal towards which the research has been directed was stated as the generation of cost and cost-effectiveness methodologies and data that will enable improved decision-making in the allocation of resources to mental health care at an international level. Specific objectives of the research were formulated as follows:

1. Development of culturally appropriate *methodologies* for the international measurement of mental health service utilisation and costs;

2. Generation of comparative service utilisation, cost and outcome *data* on the basis of international studies of major psychiatric disorders and key policy issues;

3. Exploration of the *inter-relationships* between the costs of psychiatric disorders and a range of individual and site-level characteristics;

4. Examination of the varied socio-political, financial and health system *context*s within which mental health services are provided in different cultural settings;

5. Identification of key methodological and policy issues for the *future* conduct of international mental health economic analysis.

Discussion of the extent to which these objectives have been addressed, together with emerging findings and conclusions, will be structured around what was attempted (methodological developments), what was found (empirical findings) and what is required in the future (implications for research and policy).

6.1 Methodological developments in the multinational analysis of mental health services and costs

A considerable proportion of this thesis has been focused on methodological aspects of economic study design, data collection and analysis. The underlying reason for this focus of attention is not that appropriate methods for the economic analysis of health care are absent; there is in fact a reasonably good level of consensus around basic principles, conceptual frameworks and analytical methods (Drummond et al, 1997; Gold et al, 1996; Knapp, 1995; Hargreaves et al, 1998). Rather, it is a reflection of the additional factors and difficulties that need to be taken into consideration when conducting multi-national studies. Interest in such comparative studies is on the increase, but to date there have been limited guidelines or methods that have been developed to accompany such multi-national research questions. What follows, therefore, is a set of guidelines and considerations relevant to mental health economic studies in general, but with a particular focus on the multi-national methodological developments described earlier within the three source projects. Discussion will be structured around the following key methodological stages, drawing liberally on examples taken from the three source projects:

1. Study design and perspective of economic studies in mental health;
2. Measurement and valuation of identified costs and outcomes;
3. Comparative analysis of costs and outcomes;

6.1.1 Study design and perspective of economic studies in mental health

As in clinical evaluation, an important consideration for the review, assessment and interpretation of economic evidence is research *design*. For example, is the study a prospective, controlled trial or a retrospective study with no control group? Two further features can be added to this for economic studies, namely the *type of economic evaluation*, and the *scope or perspective* of the study. The merit of an economic study in terms of coverage and generalisability is determined to a significant extent by these three parameters (Table 6.1). Viewed as an inter-connected hierarchy of evidence, the ideal type of study upon which to base decisions

on cost-effectiveness and resource allocation is one conducted prospectively with two (or more) appropriately-sized, randomly-allocated groups of patients, for whom all conceivable costs and outcomes are measured in a common currency. Such a study has yet to be completed in mental health care, largely because of the demanding requirement to convert all costs and consequences into monetary units. Most studies to date have been cost-effectiveness or cost-consequences analyses, based on a range of clinical data sets and employing the cost perspective of the formal service sector.

Table 6.1 Study design parameters

Parameter 1 ***Type of clinical data*** (What ratings are based on)	**Parameter 2** ***Costing scope/perspective*** (What costs are included)	**Parameter 3** ***Type of economic evaluation*** (How costs & outcomes combined)
Non-empirical (e.g. claims database)	*Single care agency* (e.g. health service only)	*Cost-minimisation analysis (CMA)* (outcomes are the same)
Observational (e.g. cross-sectional study)	*All formal care agencies* (e.g. voluntary sector included)	*Cost-effectiveness analysis (CEA)* and *cost-consequences analysis* (e.g. cost per change in depression)
Quasi-experimental (e.g. retrospective study)	*Formal & informal care agencies* (e.g. lost employment included)	*Cost-utility analysis (CUA)* (e.g. quality adjusted life year)
Experimental (e.g. RCT)	*All societal costs* (e.g. user/carer distress included)	*Cost-benefit analysis (CBA)* (all costs and outcomes monetised)

Study design

Since economic analyses often take place alongside clinical evaluations or trials, the design of the study will typically need to be agreed in conjunction with other evaluators. The most desirable design requirements for the economic evaluation of a mental health care intervention revolve around the presence of a control group (against which to draw comparisons with the intervention group), and the prospective follow-up of these two groups over time (one year would be sufficient in most studies). This 'experimental' study design is the 'gold standard' of clinical and economic evaluation, since it is able to demonstrate most clearly that changes in selected measures are attributable to the intervention, as opposed to other possible explanatory factors ('confounding' variables). Where it is not possible or practicable

to carry out an experimental study, an observational study design can be used; this design may have better external validity – preserving the context in which care is provided – but shifts the focus of the analysis towards identifying associations between the intervention and changes in costs or outcomes (as opposed to attributing a causal relationship) (Black, 1996).

In terms of the design of the three source projects, the EPSILON study was a cross-sectional survey of prevalent cases of schizophrenia, the LIDO study was a one-year prospective observational study of major depression, and the MENDIP study was a short-term (3 month) prospective quasi-experimental study, with intervention at the level of the primary health care centre as the unit of contrast. None of the studies employed a randomised controlled design. The main strengths and limitations of the chosen study designs for the three studies are summarised below in Table 6.2.

Table 6.2 Summary of study designs employed in the three source projects

	Study design	**Strength(s)**	**Weakness(es)**
EPSILON study	Cross-sectional	Less resource-intensive (no follow up procedures)	Unable to measure change over time (outcomes);
LIDO study	Observational	Naturalistic	No intra-centre control group
MENDIP study	Quasi-experimental	Health-seeking behaviour of whole catchment population measured	Low attendance at PHC centres reduces ability to measure effect of intervention

The main weaknesses revolve around the lack (in the case of the EPSILON study) or short-term nature (in the case of the MENDIP study) of follow-up assessments, and the absence of a genuine control group against which to demonstrate the impact of treatment or intervention on the targeted population. Set against this, the chosen design of both the LIDO and MENDIP studies did allow for the assessment of everyday clinical practice and/or health-seeking patterns in identified populations with a diagnosable condition (an important feature commonly overlooked or undermined in experimental studies that are usually carried out under atypical conditions). For example, the finding that only a modest proportion of subjects enrolled into the MENDIP study actually attended the primary health care centres where mental health training and care had been incorporated is highly relevant to the

planning and cost-effectiveness of mental health care in these settings, yet would not have been revealed by an experimental study of a selective (and unrepresentative) sample of PHC attenders.

However, while there is certainly a need to include cross-sectional and observational study designs in mental health care evaluation, the default study design option for the 'core business' of assessing the relative cost-effectiveness of competing mental health care interventions is a prospective, controlled study using an experimental design. Although such a design poses known problems relating to external validity (Black, 1996), the absence of a randomised control arm against which relative or incremental changes in costs and outcomes can be compared is likely to represent an overriding limitation of alternative, naturalistic study methods. Put another way, there is a need to demonstrate that changes in costs and outcomes are caused by, rather than merely associated with, the intervention under investigation. Furthermore, external validity constraints, particularly for multi-site studies, can be markedly reduced by the selection of representative study sites, matched study facilities, comparison of findings across sites with shared health system characteristics, and examination of contextual factors including access to, and the responsiveness of, the local health care system.

Mode of economic evaluation

For intervention studies that have an experimental design, consideration must be given to the mode of economic evaluation (that is, the manner in which costs and outcomes data are to be combined for analysis). The simplest of cost evaluations is commonly referred to as *cost-minimisation analysis*, although this is only appropriate if outcomes are known or found to be identical (which is unlikely due to the multi-dimensional nature of mental health outcome studies), in which case the task is merely to establish the least cost method of achieving these outcomes. A much more common mode of economic evaluation in the field of mental health care is *cost-effectiveness analysis*, which assesses not only the costs but also the outcome of an intervention, expressed in terms of cost per reduction in symptom level, cost per life saved, etc.. Where there is more than a single measure of outcome being

investigated, as is often the case in psychiatry and related fields, it is more correct to label this type of study as a *cost-consequences analysis*. This mode of evaluation is likely to represent the default choice in most contexts, and has the advantage of presenting an array of outcome findings to decision-makers. The MENDIP study, for instance, captured data for three outcome domains: depression and anxiety symptoms, quality of life and disability.

Two further modes of evaluation are *cost-utility analysis* and *cost-benefit analysis* (neither type of analysis was employed in the three source projects). *Cost-utility analysis* has considerable appeal for decision-makers since it generates equivalent and therefore comparable study data ('utilities', expressed by a combined index of the mortality and quality of life or disability effects of an intervention), upon which priorities can then be based. However, there are technical difficulties in using this approach, and where it has been used in psychiatry, it has not performed very well to date (Chisholm et al, 1997a; but see Section 6.3.2 for a discussion of how utility measurement is being used to generate generalised estimates of the relative cost-effectiveness of a wide range of mental health care interventions globally).

A similar conclusion can be reached with respect to the final evaluative option - *cost-benefit analysis* - which refers to a form of evaluation in which all costs and outcomes are valued in monetary units, thereby allowing assessment of whether a particular course of action is worthwhile, based on a simple decision rule that benefits must exceed costs. This approach is difficult to undertake because of the requirement to quantify outcomes in monetary terms, and consequently is found very rarely in mental health care evaluation. However, methodologies are being developed which aim to obtain direct valuations of health outcomes by patients or the general public, such as 'willingness-to-pay' techniques, where an individual states the amount they would be prepared to pay (hypothetically) to achieve a given health state or health gain (Healey and Chisholm, 1998).

Costing scope and perspective

The clinical and social burden imposed on individuals, families and communities by mental health problems contains an economic dimension. This economic dimension covers not only the costs associated with health and social care support of users (in the past referred to as 'direct' costs), but also the knock-on effects (or 'indirect' costs) of mental disorder, such as the impact on someone's ability to work. Inconsistent definition of what constitutes 'direct' as opposed to 'indirect' costs has led to a move away from the use of these terms, to be replaced by the more useful distinction between health care (and other formal sector) costs and patient/family costs.

A final key decision to make at the design stage of an economic study therefore relates to the scope or perspective of the evaluation. This refers to the viewpoint from which the analysis is being taken, which, in ascending order of comprehensiveness, might be that of a particular agency or government department (e.g. ministry of health), the statutory/formal sector as a whole (e.g. including social services), or a societal perspective which assesses the impact of the intervention on all agencies, including patients themselves as well as their carers. The choice of viewpoint, which will influence what costs and outcomes are to be measured, should be determined according to whether the intervention under study is expected to exert a differential impact on these various agencies/sectors. However, since comprehensive mental health care requires multi-disciplinary inputs, the adoption of a single agency perspective is unlikely to be appropriate for most evaluations. Rather, an analysis that seeks to identify the costs falling to the multiplicity of care agencies involved, plus any costs incurred by users or carers (typically lost employment opportunities as well as any payments for medication or institutional care), is likely to represent the most suitable perspective. A final category of costs covering, for example, the anguish or distress of carers or users, may also enter the analysis. Increasingly these costs can be valued by means of techniques such as 'willingness to pay' or measurement of an individual's utility (Healey and Chisholm, 1998).

Table 6.3 provides a summary of the resource utilisation and costs measured in the three source projects for this thesis. The first issue to note is that all of the three studies provide comprehensive estimates of direct care and treatment costs, covering both specialist / secondary care and community / primary care services as well as social care support where applicable. In this respect alone, these studies are doing at least as well as the vast majority of completed economic studies in the mental health field. Only in the MENDIP study, however, were the consequences of illness on the patient and family, in terms of lost employment, informal care giving and travel / time costs, fully quantified in monetary terms. Informal care-giving *was* assessed in the EPSILON study, but qualitatively via the administration of the Involvement Evaluation Questionnaire to family members (IEQ; Schene and van Wijngaarden, 1992), while it was decided to exclude this dimension of assessment in the LIDO study due to the limitations of self-report and the additional expense of interviewing family members. Travel and time costs were also not included in the EPSILON and LIDO studies since, unlike the MENDIP study carried out in rural areas of India and Pakistan, they were not expected to contribute significantly to total costs. The final issue to note is that in none of these three studies could the longer-term outcomes of illness be measured, since one study was cross-sectional and the other two were restricted to relatively short follow-up periods.

Table 6.3 Summary of costs measured in the three source projects

Cost categories	EPSILON study	LIDO study	MENDIP study
Care and treatment			
• Treatment (drugs, therapy)	✓	✓	✓
• Inpatient / residential care	✓	✓	✓
• Day care / group support	✓	✓	N/A
• Outpatient / primary care	✓	✓	✓
Patient and family			
• Informal care	(via IEQ)	✗	✓
• Lost work opportunities	✓	✓	✓
• Travel and time costs	✗	✗	✓

6.1.2 Measurement and valuation of costs and outcomes

Measurement of resource utilisation

Resource utilisation data relating to identified service components can be collected in a number of ways, depending on the design of the study, the coverage/extent of service components and the access to/quality of service provider databases (see Section 3.2.3 for a more detailed description of these issues in relation to the EPSILON study of schizophrenia).

Economic analysis carried out alongside clinical evaluations offers a number of assessment points for the collection of individual service utilisation data. Individual profiles of service use can be constructed over a defined retrospective period via the administration of a service receipt schedule. Prospective studies provide an additional alternative to resource utilisation data collection, namely data collection through the keeping of a diary of any contacts made, rather than the completion of a formal interview-based schedule. An alternative method for eliciting data on individual service contacts is through the examination of patient records kept by service providers - particularly if these records are computerised - including hospitals, primary care providers and social services. Sole reliance on these data sources is made difficult by the multiplicity of databases on which an individual's service contact(s) may appear and the widespread potential for non-completeness and under-reporting. However, data from these databases may be sufficient in certain locations (for example, Seattle, where a series of depression studies have used administrative databases; Von Korff et al, 1992; Simon et al, 1995), or can act as useful cross-reference / validation of data obtained through interview.

The disparate needs of different client groups translate into different patterns of demand for services. For example, the service demands of people with common mental disorders may be quite modest, focusing on primary health care and social care contacts, plus other support in the form of (more specialist) counselling or psychological therapy. This is quite different to the respective needs of users with more severe or enduring mental disorder, such as people with schizophrenia, whose

needs are likely to encompass a wide range of services over and above those cited above, such as psychiatric inpatient and outpatient hospital services, housing or residential care, structured day care support and activities and sheltered employment (see, for example, the range of service components included in the service receipt schedule used for the EPSILON study at Appendix A). The extensive range of services that people with mental health problems may use means that most evaluations need to adopt a wide coverage, which points to the usefulness of an instrument that pulls these disparate service components together in a single form.

In each of the source projects, a resource utilisation schedule was developed for collecting service receipt data over a retrospective period of 3 months (see Appendices A, C and E). The principal advantages of this approach to service utilisation data collection include:

- clear definition of service categories
- semantic equivalence and standardisation of use between participating sites
- collation of all resource use (and other) data necessary for economic analysis
- administration at the same time points as other clinical/functioning measures

These perceived advantages were borne out by the application of these service receipt schedules in the three source projects: comprehensive resource utilisation data necessary for the economic analysis of support costs, as well as socio-economic and informal care-giving data, were collated in a standardised format and, because the schedule was administered in an interview-format concurrently with other research instruments, completion rates were very good in all three studies.

Measurement of service costs

For each item of resource utilisation, a unit cost estimate is required, such as a cost per inpatient day, or cost per contact with a primary care worker. It is necessary to compute these estimates using a range of data sources, including national/local government statistics, health authority figures and specific facility or organisation revenue accounts. The broad perspective to be employed in the costing of services is

an economic one, such that in principle service costs are derived by reference to their *marginal long-term opportunity costs.* In practice, derivation of costs in this way is difficult. It is therefore common to use *short-term average costs* as a proxy for long-run marginal costs (Beecham, 1995).

Collection and estimation of service costs across different countries is complicated by the shortage of good quality cost data, the diverse accounting rules and budget categories that exist, and the alternative payment mechanisms to health care providers. In addition, many health systems operate on a 'fee for service' basis, but these fees or charges may not reflect the true opportunity cost of a service and therefore need to be treated with great caution. Unit cost data collection in a multinational study can be greatly facilitated by the use of a standardised protocol and accompanying templates for data entry. Appendix D, which describes the unit cost protocol used in the LIDO study, provides a full example of the principles and procedures that can and should be pursued in studies of this kind.

For investigation of pooled cost data, it is necessary to work in a common currency (such as US $). As argued earlier, simple use of exchange rates is not advisable, owing to the volatility of certain currencies, plus the different 'purchasing power' of different countries represented in a study. It is therefore necessary to adjust the costs of services in individual countries by a conversion factor, such as a 'purchasing power parity', which reflects the *relative* cost of health services in particular sites. This mechanism has the intentional effect of equalising the worth of health care service inputs/costs across the various sites. To date, however, the calculation of PPPs has been restricted to the level of overall gross national product (Organisation for Economic Co-operation and Development, 1996). Arguably, such GDP PPPs may not adequately reflect differences in the health sector specifically, as was suggested in the discussion of the marked differences in the costs of care observed across the LIDO study sites (Chapter 4, section 4.4). The availability of health-specific PPPs will clearly provide more sensitive adjustment of the relative price levels of health care provision.

Measurement of outcomes

There is an important distinction to be made between indicators of intermediate outcomes and final outcomes. The former category, which can also be referred to as process indicators, should not ideally be the focus of the analysis, since positive changes in, for example, attendance or detection rates may not in fact result in improved patient welfare or mental health. Thus, while process indicators are undoubtedly an important source of differentiation between study samples at the institutional level, their use as indicators of improved patient welfare needs to be treated with caution. Final outcomes, on the other hand, are concerned with detecting changes in the physical, psychological or social well-being of individuals, and commonly revolve around the measurement of symptoms, functioning and disability, quality of life and service satisfaction. In the three research studies, a wide range of outcome measures were employed across these domains, as summarised in Table 6.4. All of these measures are well-validated and reliable instruments that have been used extensively in mental health services research. A primary objective of the EPSILON study was of course to further assess the reliability and usefulness of these promising instruments in different national settings. As previously noted, none of the source projects were designed to elicit data on utilities or monetised benefits, which accounts for the absence of summary indices of outcome such as the Quality Adjusted Life Year (QALY). It can be expected that with the further development and refinement of cost-utility methods, such measures of outcome will be more routinely included as a corollary to more condition- or domain-specific measures.

Table 6.4 Summary of outcomes measured in the three source projects

Outcome domains	EPSILON study	LIDO study	MENDIP study
• Symptoms	BPRS, GAF	CES-D, SCL-90	HDRS
• Quality of life	LQOLP	WHOQOL Bref QLDS	WHOQOL Bref
• Disability / functioning		MOS SF-12	BDQ
• Service needs	CAN	-	-
• Service satisfaction	VSSS	-	-
• Family burden	IEQ	-	(via CSRI)

Note: Full names of measures can be found in the relevant Chapter and also in the Glossary

Service system profiling

Over the course of conducting the three multi-site source projects, it became increasingly apparent that the uptake of services stands to be significantly affected by their availability. In the extreme case, sites in which services are entirely absent (for example, residential care in the community for people with enduring mental illnesses) will clearly result in zero utilisation and therefore cost. Whenever the objectives of mental health services research include multi-site or multi-national comparisons, therefore, a description and understanding of the service context in which individual resource utilisation is being measured is required for the appropriate analysis and interpretation of study findings. Moreover, differential levels of service provision and utilisation within and between sites are predicted to be associated with socio-demographic variables such as age, gender, employment status and income. In addition to the collection of socio-demographic characteristics of study subjects, therefore, there is a need to derive a socio-demographic profile of the local population. A good example of a local socio-demographic and service profile, developed and adapted for the LIDO study, appears at Appendix B (results from which are presented in Table 4.4 and discussed further in Section 6.2).

Two main products of this kind of profile can be identified: a description of the prevailing health care system in each participating site; and elicitation of site-level indicators relating to socio-demography, service provision and access. The overall usefulness or performance of such profiles can be gauged by a) the quality of the qualitative descriptions in capturing key features of the local population and health system and b) the incorporation of site-level indicators into, and their contribution to explaining variations in, quantitative cost analyses. With respect to the three source projects, it is possible to conclude that the profiles elicited for each study site have been a valuable source of reference at a descriptive level, providing essential contextual information relating to the access to and availability of a range of health services. However, data from these profiles have not been successfully introduced as higher-order hierarchical variables into individual-level cost analyses (due to an insufficient number of sites to generate the kind of variation that would usefully inform the analysis and interpretation of individual-level costs, needs and outcomes).

Future multinational studies need to be mindful of this constraint and need to adopt appropriate statistical approaches that can successfully introduce this second-order set of site-level variables (see Section 6.2.3 below).

6.1.3 Comparative analysis of costs and outcomes

As the number of economic studies relating to mental health care has risen, so in general has the standard of data analysis and presentation, in no small part due to the higher standards and expectations of peer-review journals and commissioning agencies (Drummond et al, 1996; Gold et al, 1996). In particular, increasingly sophisticated statistical and econometric methods are now being employed by researchers in a bid to overcome some of the difficulties associated with the analysis of cost and cost-effectiveness data. A fundamental feature of costs data in mental health care evaluation is that uptake of the range of specified service components, each with their differing cost implications, is highly variable. The result of this variability is that pooled individual service use and cost data tends to be highly positively skewed, reflecting the relatively heavy use of services by a small number of sampled individuals, and compounded if those services, such as inpatient care, carry high unit costs. The skewed distribution of costs has important consequences both for the design and subsequent analyses of data, the most notable problem concerning the statistical power of a study (the probability of avoiding a type II error, that is the decision to not reject the null hypothesis, when in fact it is false).

Study power

Alongside calculation of the sample size needed to show a statistically significant clinical difference, there is an increasing requirement to demonstrate that sufficient numbers of subjects are being recruited to and retained in a study in order to show that a real cost or cost-effectiveness difference has been observed, rather than a difference that could be attributable to chance. One important decision concerns what constitutes a worthwhile difference in cost or cost-effectiveness (effect size). The answer to this will depend on the perspective of the study and to an extent the societal burden of the disorder under investigation (a small cost-effectiveness

advantage of 10% for one intervention over another in the treatment of a highly prevalent or costly mental disorder may be considered more politically attractive than an equivalent relative advantage for treating a rare or lower impact disorder). An indicative range to consider when determining the effect size (differences in cost-effectiveness) might be 10-30%. The sensitivity of power calculations to the variance of the parameter(s) under investigation (as well as the effect size) means that the numbers needed to show a statistically significant cost difference between groups or over time may be very large, and may exceed the number necessary to show a clinical difference (Gray et al, 1997; Sturm et al, 1999).

The importance of study power can be illustrated by reference to the three source projects. The EPSILON study was powered on the minimum number of cases needed to undertake a central component of this particular research study, namely the reliability analysis; the study was not specifically powered to detect significant cost differences within or across the five sampled populations. Even for total aggregated costs, standard deviations are typically double that of the mean, so this inevitably casts doubt on the power of the study to detect statistically significant differences in more disaggregated components of resource utilisation and costs. (In fact, many of the inter-site differences tested for did reach statistical significance at the 5% level, which indicates that there were sufficient numbers of cases to disprove the null hypothesis.) With respect to the LIDO study, a series of calculations were performed, which suggested that large service cost differences would need to be observed between treated versus non-treated cases at baseline (a factor of 2.5); in terms of change over time, service costs would have to decrease by two-thirds in order to show a statistically significant difference (per site), or by 23% if site-data was pooled, whereas quite small changes could be detected in CES-D or health status. (Such predictions have been borne out by the 3-month prospective analysis, which shows few significant changes over time with respect to cost parameters but a substantial number of significant changes in outcomes; Tables 4.8 and 4.9). Finally, a convenience sample of a minimum of 50 cases per catchment area was established for the MENDIP study, owing to the limited time and resources available for this pilot project. Nevertheless, a number of statistically significant changes in both costs and outcomes were observed with this sample size (Tables 5.9 and 5.10).

Reporting of cost data

In terms of data analysis, the key implication of skewed cost data is that parametric statistical approaches, which require normality of distribution, may not be appropriate, suggesting therefore that either non-parametric approaches or a process of data transformation may be required. Two common methodologies that have been used by researchers when faced with the prevailing problem of skewed costs data have been the use of median rather than mean values as the key measure of central tendency (with consequent reliance on non-parametric tests such as a Mann-Whitney U test), and transformation of the data onto a log or other scale. While use of the median may be useful for showing the 'typical' cost of a study subject, it is based on ranked data (rather than actual values), ignores the influence of outliers and does not capture the total or (arithmetic) mean cost of treatment and care, which is the measure of direct policy interest (Barber and Thompson, 1998). Likewise, while log-transformation of costs data may resolve the problem of skewness, the resulting test of difference between groups is on the geometric rather than the arithmetic mean. The estimated difference in log-costs (or any other non-linear transformation) of two treatments is not the same as the log of the estimated cost difference.

Since logarithmic (or other) transformation of costs data and the use of standard non-parametric tests are usually inappropriate methods for dealing with skewed data when the focus of the study is on the comparison of group means, what can be done? One increasingly used approach to statistical inference in this situation is the non-parametric 'bootstrap', which makes no distributional assumptions, yet is able to generate standard errors and confidence intervals for the parameter of interest (Efron and Tibshuani, 1993; Mooney and Duval, 1993). Confidence intervals (not just standard deviations) around observed differences in mean costs should ideally be presented, since these provide a more informative measure of the magnitude of variability and effect size (see, for example, Table 3.7). Statistical inference using this non-parametric bootstrapping method commonly reveals that parametric tests such as the t-test are in fact robust to non-normality (particularly if the study sample size is relatively large, the distribution of costs is not too severely skewed and if the extent of skewness is similar across groups; Barber and Thompson, 1998).

When undertaking comparative analysis of pooled multinational data, one further need, even after controlling for underlying price differences in the costs of provision (via the application of purchasing power parities), is to report mean cost values that take into account underlying differences between sites with respect to socio-demographic and clinical characteristics. In the EPSILON study, for example, adjusted means were derived via a simple OLS regression of costs on centre, gender, marital status, ethnicity, language, employment (factors), plus age, education, GAF and BPRS (covariates).

Multivariate cost analyses

Skewness of cost data also presents problems for the modelling of costs and other variables through multivariate analysis, since again the key assumptions behind ordinary least squares (OLS) regression — normality of distribution, homoskedasticity and independence in the residual errors — may be broken. Where this is shown to be the case, there are a number of alternative analytical strategies that can be considered. Firstly, and in the same vein as two-group comparisons of mean costs, OLS regression coefficients can be re-estimated using non-parametric bootstrapping, thereby avoiding the strong distributional assumptions of parametric estimation. Independent variables that are significantly associated with cost can be identified in this way, and findings can be compared with those reached via conventional OLS estimation (see Tables 3.8 and 3.10).

An alternative method for addressing the related problems of skewness, outliers and heteroscedasticity is transformation of the cost dependent variable onto a logarithmic scale (Diehr et al., 1999). After log transformation, it is often found that residual errors are normally distributed. As mentioned above, however, transformation of costs onto a log-scale produces geometric mean values. Where the focus of interest is on reporting arithmetic mean cost results in the original units of currency, therefore, it is necessary to apply a factor that overcomes this 'retransformation problem', such as Duan's 'smearing factor' (Manning, 1998). A final method that can be considered in order to explore the possibility that alternative models with differing distributional assumptions might fit the study data better is generalised linear modelling (GLM),

using for example a gamma distribution with a log-link function (Diehr et al., 1999). Table 3.10 provides an example of how these separate strategies were applied to the pooled EPSILON study data set of people with schizophrenia living in five European countries, involving successive OLS estimation on the untransformed and log-transformed cost data, followed by the generalised linear model.

A further analytical stage that has great relevance to multinational cost and cost-effectiveness studies in mental health relates to the potential for multi-level modelling. Where data on site-level indicators of service provision, financing and access have been collected, for example, adjustment for these effects can be made via the conduct of random effects, graphical or multi-level modelling, which enable these intermediate, site-level influences to be incorporated into analyses of individual costs, needs and outcomes. An alternative method for incorporating these factors into cost:outcome studies is via an instrumental variable approach, which employs observable factors that influence treatment but do not directly affect patient outcomes, thereby isolating the effect of treatment variation that is independent of unobserved characteristics (Lu, 1999). The use of these statistical methods, however, requires an appreciable number of observations or degrees of freedom at the intermediate or site level to be practicable (see section 6.2.3 below).

6.2 Empirical findings from three international mental health economic studies

6.2.1 The economic burden of psychiatric disorders

As reviewed in Chapter 2 of the thesis, ample documentation and research has been generated over the last forty years which shows that psychiatric disorders are relatively common throughout the world, highly disabling, chronic and/or recurring, which translates into high levels of global mortality and disability (Murray and Lopez, 1996) and a considerable health care service burden (Harding et al, 1983; Jablensky et al, 1981; Ustün and Sartorius, 1995). This burden has also been measured from an economic perspective, which has pointed to the wide range of costs that are incurred by society, not only in terms of health and social service

provision, but also in terms of production at the level of households and employers (Box 2.1). In practice, lack of data and measurement difficulties have made such comprehensive estimates hard to calculate. The most comprehensive estimates of the economic burden of psychiatric disorders have been achieved by 'cost of illness' studies via the extrapolation of service use and cost findings from empirical studies to whole national populations with a particular condition, supplemented by the imposition of assumed values for productivity and mortality losses. Where such studies are performed rigorously, such as the recent estimate for schizophrenia in Canada (Goeree et al, 1999b), they provide a valuable depiction of the multifaceted economic consequences of psychiatric disorder, as well as a useful tool for informing service planning, policy debate and resource allocation (Rupp et al, 1998). All too often, however, such studies have employed sub-optimal data sources and methods that have provoked academic controversy more than they have stimulated policy development (Jonsson and Bebbington, 1995; Woods and Rizzo, 1997).

The breadth or comprehensiveness of cost measurement in empirical studies, however, has typically been narrower than cost of illness studies. This may be a deliberate decision or choice (for instance, the evaluation may only be interested in the impact of psychiatric disorder on the health service), but is more commonly a function of the measurement problems associated with longer-term consequences of psychiatric disorder in what are time-limited investigations (it is rare to find clinical or economic evaluations that exceed a two-year period of follow-up). Focusing on direct care and treatment costs, the economic burden associated with the psychiatric disorders covered by the three source projects – schizophrenia, major depression and common mental disorders – is still all too apparent. Table 6.5 provides annual estimates of total baseline care and treatment costs, expressed in international U.S. dollars (i.e. using PPPs rather than exchange rates as the conversion factor), for the sampled populations in each participating study site. To provide some measure of the excess burden associated with these disorders, the condition-specific service costs for the sampled populations at baseline assessment are compared to the average per capita health care expenditure for the total population in each country, based on national health account indicators for 1997 (WHO, 2000a).

Table 6.5 Comparative cross-cultural economic burden of schizophrenia, major depression and common mental disorders

Country (study site)		Estimated per capita annual health care expenditures, international dollars ($US, 1997-98)									
		Total national population [a]			*EPSILON sample: treated schizophrenia*		*LIDO sample: unrecognised major depression*		*MENDIP sample: untreated depression / anxiety*		
		Total	Public	Private [b]	Public [c]		Total [c]		Public		Private [b]	
					Cost	% Public	Cost	% Total	Cost	% Public	Cost	% Private
AUSTRALIA	(Melbourne)	1,601	1,153	448			1,636	102				
BRAZIL	(Porto Alegre)	428	208	220			1,708	399				
DENMARK	(Copenhagen)	1,940	1,636	304	15,398	941						
INDIA	(Bangalore)	84	11	73					9	82	79	108
ISRAEL	(Be'er Sheva)	1,402	1,051	351			2,240	160				
ITALY	(Verona)	1,824	1,042	782	9,019	865						
NETHERLANDS	(Amsterdam)	1,911	1,351	560	5,856	433						
PAKISTAN	(Rawalpindi)	71	16	55					58	105	140	254
RUSSIA	(St Petersburg)	251	193	58			108	43				
SPAIN	(Barcelona)	1,211	855	356			872	72				
	(Santander)	1,211	855	356	2,415	282						
UK	(London)	1,193	1,156	37	9,410	814						
USA	(Seattle)	3,724	1,643	2,081			3,264	88				
Study average (pooled mean)					7,809		1,620					

[a] Annex Table 8, World Health Report, 2000; estimates are for 1997 (WHO, 2000a)
[b] Includes out of pocket expenses, voluntary insurance and other private expenditures
[c] Excludes medication costs

Total estimated treatment and care costs for people with schizophrenia, as captured in the EPSILON study, ranged between US$ PPP 2,415 - 15,398 per year. Virtually all of these costs are public health care expenditures. In the Danish, English, and Italian sites, these costs are more than 800% of the average per capita public health care expenditure in these countries. Costs of care in the Dutch site were 433% and in the Spanish site 282%, most likely owing to the very low admission rate in the former sampled population and the relatively modest set of public health care services available to the latter sampled population (see Chapter 3, section 3.5).

Baseline estimates from the LIDO study, converted into annual figures, represent the costs of *unrecognised* major depression, and range from US$ 108 in St Petersburg to $3,264 in Seattle, with a pooled mean for all sites of US$ 1,620. Since these estimates incorporate some private expenditure in a number of sites, comparison is made to the total health care expenditure figures for each country (minus medication costs), which reveals that in three sites – Barcelona, Melbourne and Seattle – the costs of untreated major depression are 72-108% of average per capita expenditure, whereas in Be'er Sheva (160%) and Porto Alegre (400%) the costs are far higher. In contrast, the service costs of untreated, depressed subjects in St Petersburg were less than half the average per capita expenditure, perhaps highlighting the significant stigma and low prioritisation attached to depression in the Russian Federation.

The data collection method adopted in the MENDIP study provided the opportunity to compare public and private expenditures separately. Again, baseline expenditures were multiplied by four to derive annual cost estimates, in this case for the economic burden associated with untreated common mental disorders in the community (as opposed to a sample of PHC attendees). Although the costs of publicly provided services are very low ($9 in India, $58 in Pakistan), these actually represent 82% and 105% respectively of the average per capita public health expenditures in these countries. In terms of private expenditures (including medication), the estimate of $108 in Bangalore is again close to the national average, whereas in Rawalpindi, the privately borne costs are two and a half times the national average ($140 compared to $55). The preponderance of these costs were therefore privately incurred expenditures, of which a significant proportion was on consultations with local

general or traditional practitioners (neither of whom are trained or qualified to detect or treat psychiatric morbidity). Thus, whilst individuals (and households) are seeking help, and spending significant amounts of money in the process, they are not in the main receiving appropriate care for their mental health condition.

Summarising and comparing data in this way is certainly subject to a number of limitations and should accordingly be treated with caution – sampled populations or localities may not be representative of their respective clinical populations or countries, and there are other potential contributors to cost variation that may not be accounted for. What the findings do seem to show, however, is that the direct costs of treatment and care for psychiatric disorders are at least as great as average per capita health care expenditures, and that the excess cost of disease increases with the severity of the underlying disorder – thus for schizophrenia care in Europe, costs are three to nine times the average. These estimates do not take into account other significant contributors to the societal costs of psychiatric disorders, including informal care-giving and lost work opportunities, which substantially increase the level of excess economic burden. For example, the imputed costs associated with reported levels of informal caregiving, travelling time/expenses and lost work days in the MENDIP study exceeded formal health care costs by a factor of as much as three.

6.2.2 Associations between mental health care costs and outcomes

The preceding section took baseline mean cost values for the sampled populations in each of the three projects in order to demonstrate the economic burden associated with schizophrenia, major depression and common mental disorder in a selection of countries. This section moves onto a broader consideration of the observed inter-relationships between health care (and other measured) costs, on the one hand, and a range of individual- and site-level characteristics, either at one point in time (EPSILON) or over time (LIDO and MENDIP). It should be stressed that prospective associations between costs and outcomes for the latter two studies were restricted to the short-term owing to the unavailability of longer-term follow-up assessments at the time of submission.

In an optimal health care system, service costs at the individual level should be strongly associated or correlated with the severity of the disorder and the clinical need for care (other things being equal, including user preferences for specific care modalities). Resources would be targeted and consumed in accordance with these criteria, irrespective of differences in access to services or other supply-side constraints. When such hypotheses are subjected to real-world analyses of these inputs and outputs, an unsurprising finding is that the proportion of individual-level cost variation explained by measures of symptom severity and need-related factors is in fact quite low. Site-specific equations generated for the EPSILON study of schizophrenia, for example, show that while symptom severity (BPRS and GAF scores) and need (CAN scores for met and unmet need) do enter into the reduced, parsimonious regression models for all sites (Table 3.9), the overall proportion of variation explained by the models was no more than one third (adjusted R^2 values ranged between 12-32% across the five sites, quite typical results for regression models in this population; Chisholm et al, 1997d; McCrone et al, 1998b; Haro et al, 1998; Bonizatto et al, 2000). Patterns of association with cost in fact varied quite markedly across the sites, and included significant inter-relationships with socio-demographic factors such as age and employment status. The inclusion of quality of life and service satisfaction measures did not increase the explanatory power of these models, nor were there any significant associations with cost in any of the five sites.

Turning to the LIDO depression study, a key finding of the 3-month prospective analyses was evidence of a cost-offset effect, indicating a change in the distribution of costs as previously unrecognised cases of major depression came into contact with services; although the overall cost of care did not alter over the first three months of follow-up, the proportion of cost associated with speciality mental health care did change (Figure 4.3). Across all six sites, general medical care service costs decreased significantly, by an average of $57 (95% CI –110, -3), while mental health care costs increased by an average of $47 (95% CI –15, 110). For individual sites, however, paired sample t-tests of cost differences over time were not significant, partly due to modest effect sizes, further compounded by the marked uncertainty around point estimates of cost. In terms of outcomes, the results provide a clear and consistent picture of positive change in symptom severity, quality of life and

functioning cross-culturally. CES-D scores decreased by an average of 6 points (from 29.3 to 23.3., 95% CI -6.7, -5.3), QLDS scores decreased by 1.3 points (95% CI –1.5, -1.0; lower scores indicate better QoL) and SF-12 mental health summary score rose by an average of 4.9 (95% CI, 4.1, 5.6). The main conclusion that can be reached over the short-term follow-up period, therefore, is that there is an association between increased rates of appropriate treatment (as measured by the rise in mental health speciality costs) and improved clinical outcomes.

The significant improvement in the outcome domains of depression, disability and quality of life for both standard care localities was also a striking finding of the MENDIP study. Although these results may be partly explained by spontaneous remission or improvement, particularly in the Rawalpindi site where there was a significant proportion of acutely depressed cases, it does suggest that interviewing individuals about their mental health state, and advising them to seek care locally, may have exerted an intervention effect itself. With regard to the economic dimension, mean cost of contacts with government primary health care workers increased in the localities where mental health care training and support had been introduced (as hypothesised), whereas there was little change in the standard care localities. By contrast, costs of contacts with community-based private health care providers (general practitioners, traditional healers) dropped in all localities. Comparison of change scores between those who had or had not used government health care services revealed a positive association between health care costs and clinical and social outcome, but this was not restricted to the localities where mental health training and support had been introduced (indeed, the only statistically significant difference was in the standard care locality of the Bangalore site).

6.2.3 Supply side influences on the access to and uptake of services

As clearly illustrated by multivariate analyses of the EPSILON study data set, individual-level associations are only capable of explaining cost variations to a modest extent. This points to the presence of considerable 'noise' around such individual-level model specifications, and raises the question of whether utilisation rates may be influenced by prevailing levels of service access, availability and other

supply-side factors. In terms of service availability, the EPSILON study revealed a fourfold difference in residential places between Copenhagen and Santander, which closely mirrored the difference in service costs for these sites (Figure 3.2). In a similar vein, the LIDO study revealed marked differences with respect to the health care financing mechanisms and levels of service availability across the six sites, which could also be linked to differential service uptake and cost (Table 4.4).

In both the LIDO and MENDIP studies, an attempt was made to examine individual-level factors that may have influenced the decision to seek care or effected the quality or quantity of care received. These analyses revealed a number of recurring 'barriers' to appropriate care across sampled populations (inconvenience, medication side-effects, etc.) but also some marked differences, for example the financial barrier relating to the cost of medication in St Petersburg (LIDO study) or the geographical barrier of distance in the Lehtrar locality of the MENDIP study. While the perceived barriers to access did not alter appreciably in the LIDO study, a further striking finding of the MENDIP study was the discernible shift in the health-seeking behaviour of the standard care localities in both sites, reflected by an increase in the perceived access to, preference for and use of government primary care services.

Exploration of the inter-linked processes of access to appropriate care, perceptions about local health providers and actual utilisation of services in the MENDIP study indicated that the successful implementation of a community mental health care programme is likely to be contingent on the health-seeking behaviours of both the local population at large and the specific target groups for whom the intervention is intended. Most notably, it was apparent that only a modest proportion of sampled subjects used government-provided primary health care services, thereby rendering the remaining proportion unable to benefit from mental health care and treatment available at the two integrated primary health care centres. What these findings suggest is that socio-demographic characteristics and individual perceptions about health services, rather than depression or disability status *per se*, may have had the more important bearing on service use and treatment choice, and that changes in perceived access to care, preferred provider and actual use of services were largely independent of the introduction of mental health training and support.

The marked differences in service access and availability seen in all three source projects are not in themselves surprising, but clearly they have a potentially important influence on the interpretation of resource utilisation and cost findings at the level of sampled populations. Indeed, it is a fundamental conclusion of this thesis that multi-national cost comparisons, or even multi-site comparisons within a single country, need to be understood in terms of, and take account of, differential levels of service access and availability. Where it is not possible to do so – because the relevant data have not been collected, or because there are not sufficient statistical techniques to adequately control for such influences – analytical findings from pooled, multi-national data can still reveal the extent of individual or inter-site differences but cannot provide a full, integrated explanation of the relative contribution that individual versus site level factors make to these observed differences.

This conclusion can be applied to the EPSILON and LIDO studies, which despite the collection of relevant data on local socio-demographic, socio-economic and service characteristics at the site level, lacked the large number of observations or degrees of freedom at both the individual and site level needed for multi-level or random effects models (the EPSILON and LIDO studies had only four and five degrees of freedom respectively at the site-level). Instead, fixed-effect models that included dummy variables for site were adopted in the EPSILON study, the pooled regression equations for which demonstrated, for example, that the Santander site had a significant cost-reducing impact. The limitation of such fixed-effect models, however, is that they do not fully address the question of what exactly it was about Santander that had an impact on costs? On the basis of the descriptive data collected for this locality, it is possible to point to the relatively low availability of certain services such as residential care and the high proportion of subjects living with their own families as potential explanatory factors, but this is one step short of systematically incorporating these site-level characteristics into the comparative analyses of individual costs, needs and outcomes.

It is also possible that observed cost differences may be due to other, perhaps socio-cultural, factors that influence both the provision and utilisation of costs. An example of a potentially key variable in mental health care evaluative studies at this

socio-cultural level is the public perception and stigma attached to mental illness in different settings or countries. Negative attitudes to mental illness at a societal and political level may lead to a low level of priority and investment being accorded to mental health services. Equally, there may be positive mechanisms at work in local communities that engender improved awareness of mental health issues and quicker access to services for individuals in need, such as the school mental health programme evaluated recently in Rawalpindi, Pakistan (Rahman et al, 1998). Such community-level mechanisms are at the heart of the increasing interest being shown in the potential links between social cohesion – or its subset, social capital – and health (Stuart, 1999; Cullen, 2000; Kawachi and Berkman, 2000; Veenstra, 2000). The key hypothesis underpinning this research interest is that increased levels of social capital – as measured by levels of trust, reciprocity and support networks in the community – can reduce, for individuals with psychiatric disorder, the vulnerability, exclusion and hostile environment to which they are typically exposed to.

On the basis of the preceding studies, therefore, it is possible to conclude that there are three levels of actual or potential effects that need to be considered when undertaking cross-cultural studies of mental health care costs or cost-effectiveness:

- Individual-level effects – health care seeking and consumption
- Site-level effects – service organisation and provision
- Country-level effects – service system and culture

The studies reported here have systematically attempted to measure and describe inter-country variations at each of these levels, and in so doing have generated policy-relevant data on costs and cost associations at an international level, but ultimately they fall just short of a fully integrated, multi-level assessment of the respective influences of these various effects on costs and cost-effectiveness (mainly due to study design and power limitations). Unravelling the relative contribution of individual demand or need effects, provider supply responses and broader socio-cultural influences to changes and variations in costs and outcomes represents an important component of the unfinished or future agenda of health services research generally, and comparative mental health care studies in particular.

6.3 Implications for policy and research

6.3.1 Implications for mental health policy and service development

Significant advances have been made over the last forty years in treatments for a wide range of psychiatric disorders, perhaps most notably with respect to the development of psychotropic drugs (both old and new) for schizophrenia, bipolar disorder and depression, but also in terms of psychotherapeutic approaches to these disorders. Alongside and partly because of the greater availability of these novel treatments, the reorganisation of mental health care in many countries from a predominantly hospital-based service to one situated more closely in the 'community' has also brought welcome improvements to many patients (and carers).

Despite the accumulated knowledge relating to the serious impact that psychiatric disorders have on individuals, families and communities, and despite the opportunities offered by the above developments in mental health care delivery and treatment to contain (if not cure) many of the negative manifestations of psychiatric disorders, there has been very little investment into psychiatric care viewed from an international perspective (Institute of Medicine, 2000). Key reasons for this under-investment include negative and false perceptions about mental illness (stigma), low awareness of the prevalence and disabling consequences of mental disorder, and low priority in the health care programmes of most countries in the world. An unsurprising consequence of this low level of investment is that in many regions of the world individuals with major neuro-psychiatric conditions – including psychosis, clinical depression and epilepsy - go largely untreated (for example, the *Global Burden of Disease* study estimated that treatment rates for major depression in low-income countries were only 10-15%; Murray and Lopez, 1996).

The parlous state of mental health care in an international context begs the question of what can be done to reduce the existing gap between the identified burden of psychiatric disorders and current levels of mental health care investment. One key activity relates to increased political awareness via high profile reports aimed at raising political awareness of the under-recognition of and need for mental health

services, such as *World Mental Health: Problems and Priorities in low-income countries* (Desjarlais et al, 1995), Nations for Mental Health (Jenkins, 1997b), the 1999 Surgeon General's Report (DHHS, 1999) and the Institute of Medicine's forthcoming report on nervous system disorders in developing countries (Institute of Medicine, 2000). Promotion and advocacy alone, however, are not sufficient to bring about change at an operational level; there is therefore also a requirement to instigate initiatives that address pragmatic considerations such as integration of mental health into the overall health care policy dialogue and reform process that may be occurring in a country. Finally, there is a need to generate an evidence base that can clearly and succinctly point to the benefits of investment in human and social capital terms, including the reduction of disability, and the enhancement of capabilities or productivity through sector-wide reform of health and education.

What is the contribution of the three source projects to these international mental health policy priorities? Firstly, the research has demonstrated the feasibility of undertaking analysis and comparison of mental health care costs, processes and outcomes, both in a multinational context, and more specifically in low-income country settings. Demonstration of the viability and applicability of mental health economic analysis in developing countries, which was the underlying purpose of the MENDIP study, merits particular mention given the paucity of studies carried out to date and the expressed interest of policy makers and multinational agencies in obtaining cost-effectiveness data relevant to these settings. Secondly, in applying a standardised set of methods and measures, the research has been able to generate robust indicators of the economic consequences of psychiatric disorders, whether these consequences be in terms of the high health care costs attributable to the care of schizophrenia in Europe, the resource implications associated with unrecognised depression across a diverse range of international settings, or the lost productivity and household burden of common mental disorders in low-income countries. Thirdly, analysis contained in each of the three studies has explored and elicited links between health care (and other) costs and a range of clinical and social outcomes, in so doing providing support for the hypothesised positive association between service inputs and improved symptoms patients' or social functioning, as well as pointing to the scope for better targeting of resources. Finally, the conduct of the three studies has

led to new insights which have direct applicability to policy and service development, including the 'value' of specialist mental health care in producing improved clinical outcomes, and the importance of local health-seeking behaviours and other local factors in determining the suitability and likely success of the integration of mental health into primary care.

6.3.2 Implications for multinational mental health services research

Research priorities

Since the current evidence base for the effectiveness and cost-effectiveness of mental health care interventions is currently so meagre in many regions of the world, and the costs of its acquisition so correspondingly high, there is a need to identify and select priority research questions (Global Forum for Health Research, 2000). The precise information requirements for policy development obviously need to reflect local or regional realities and levels of economic development; for example, assessing the relative cost-effectiveness of older versus newer anti-depressants is unlikely to represent a high priority concern in countries where the availability of *any* anti-depressants is at issue. Nevertheless, the experiences of the three source projects covered by this thesis point to a number of broad areas where economic evidence would appear to be particularly warranted (Table 6.6; see also, Chisholm, 1999, 2000d). Addressing this research agenda represents a substantial challenge, not least because there are currently so many gaps and because findings generated in one particular setting or country cannot be readily generalised to others, owing to the heterogeneity of health care systems.

Envisaged research deliverables emanating from pursuit of these broad research objectives, again reflecting in part the conclusions of the research presented here, include: the development of a standardised methodology (consistent and comparable with other areas of health care intervention) for the collection, analysis and reporting of mental-health related resource utilisation and costs in diverse cultural settings; empirical measurement of the cost-effectiveness and cost-utility of specified interventions; identification of the effect of exogeneous socio-economic and health

system indicators (poverty, education, social capital; service availability, access and responsiveness) on mental health costs and outcomes; and contribution to future projections of comparative disease burden and health care priority-setting through modelling of prevalence, costs and DALYs for key mental health conditions (Ustun and Chisholm, 2000).

Table 6.6 Mental health policy and economic research priorities

Level of economic development	*Prevailing features of mental health system*	*Cost-effectiveness research priorities*
High-income countries (e.g. N. America, W. Europe)	Relatively well-resourced; Market-based reforms; Community-based services; New psychotropic drugs	Relative cost-effectiveness of older vs newer drugs and psychological therapies; managed care; hospital diversion
Middle-income countries (e.g. E. Europe)	Resources poorly distributed; Hospital-based services; Poor perception of psychiatry (repression of the past)	Hospital vs community based care; Prevention of alcohol abuse; Mental health promotion
Low-income countries (e.g. E. & W. Africa, S. Asia)	Very poorly resourced; Low policy priority; Very limited availability of / access to treatment / services	Availability of key, low-cost drugs; Integrating MH into primary care; Mobilisation of local resources; Demonstrating need for MH care

Data comparability

At an international level, a key research requirement is for generated cost:outcome data for mental health care interventions to be comparable to data for other disease areas in order to demonstrate issues of *relative* efficiency and affordability. Economic evaluation in mental health care has been concerned predominantly with establishing the relative worth of new or existing interventions or strategies over usual care or best alternative treatment, thereby addressing pertinent issues of technical efficiency within the health sector (i.e. identifying the most productive methods of spending defined budgets). The limitation of such mental health studies is that they do not permit normative conclusions to be drawn regarding whether any identified improvements in user outcomes are actually worth pursuing, relative to other potential areas of investment (Chisholm et al, 1997a; Healey and Chisholm, 1999).

This is an important limitation, and one that has particular relevance for multi-national studies, since the existing allocation resources varies widely between countries depending on the financial and political constraints that they are subject to.

Issues of *allocative* efficiency can be addressed by cost-benefit analysis, in which both costs and benefits are quantified in monetary terms, but the application of this mode of evaluation to mental health care is in its infancy and is fraught with difficulties, including the multi-attribute and often hypothetical nature of the health care benefits that individuals are asked to value via willingness to pay techniques (Healey and Chisholm, 1999). An alternative metric to money for assessing the consequences of intervention are summary measures or indices such as the DALY or QALY, which enable comparisons of effectiveness across health care programmes or interventions. The use of these summary measures in the context of mental health services research has been limited to date, reflecting a general unease with the use of utility measurement and a series of more specific conceptual and technical measurement concerns (for a review, see Chisholm et al, 1997a). In particular, concern has been expressed as to the sensitivity of such measures to pick up meaningful change in health status, the valuation base for attaching relative weights to different conditions (should it be that of patients, professional or the public?) and the feasibility of methods used to elicit health state preferences (such as the 'standard gamble' or 'person trade-off' techniques; Arnesen and Nord, 1999). In response, new empirical research on DALYs has focused on exploring the impact and significance of these divergent valuation methods and reference populations in different cultural settings, using a 'multi-method, multi-informant' approach (Ustun and Chisholm, 2000).

Despite the limited connection between QALYs or DALYs and the generation of cost-effectiveness evidence in mental health, such a link is needed because QALYS and DALYs are *not* in themselves sufficient as a mechanism for resource allocation and priority-setting in health care (Anand and Hanson, 1997; Sayers and Fliedner, 1997); for these tasks, there is a need for an additional component, cost, which can be related subsequently to derive costs per QALY or DALY for different interventions. A disease can place a considerable burden on a population but if strategies or

interventions to reduce this burden are costly in relation to the outputs achieved, large-scale investment would be misplaced since scarce resources could be more efficiently channelled to other burdensome conditions for which cost-effective responses were available. The applicability of such an approach in mental health services research is illustrated by a recent attempt to model efficiency in reducing the burden of depression in Australia, with results showing that significant efficiency gains in terms of cost per averted DALY can be achieved by moving towards more optimal care strategies (Andrews et al, 2001).

Informed in part by the methodological developments reported in this thesis, work is underway at WHO to produce a set of estimates for the relative cost-effectiveness of a wide range of mental health care interventions for all sub-regions of the world, adopting a generalised approach and incorporating DALYs as a measure of effectiveness. This sectoral or 'generalised' approach to cost-effectiveness analysis (Murray et al, 2000) explicitly addresses allocative efficiency questions by lifting the constraint on the current mix of interventions, thereby permitting evaluation of all options (including currently funded interventions and the consequences of no intervention at all). The costs and effectiveness of all interventions are being estimated in a comprehensive but highly standardised manner, thereby enhancing substantially the comparability of results. Given the known uncertainty surrounding point estimates of cost-effectiveness (as well as the limited ability of DALYs to pick up small changes in health-related outcomes), however, results will be presented in terms of broad categories (rather than ranked league-tables) of cost-effectiveness. Such a standardised and comparable approach to data generation and reporting holds out the very significant prospect of greater parity between mental and physical aspects of health and health care.

Generalisability of findings

The tension between universalist versus context-specific, relativist approaches to the study of social or behavioural phenomena is a recurring theme in the social sciences, as made apparent by the socio-cultural perspective on the cross-cultural studies of psychiatric disorders reviewed in Chapter 2 (section 2.2). Universalists strive to

discover similarities or shared characteristics that hold across different cultures with a view to deriving generalised statements or arguments about human behaviours or social structures; relativists, by contrast, argue that human behaviours should only be analysed and interpreted within their own cultural *milieu*. An analogous situation can be depicted with regard to the economic analysis of health care from an international perspective. At one end, highly contextualised analyses can be carried out for specific treatment modalities in particular localities, the findings from which are largely relevant to local decision-makers alone and have limited generalisability; at the other end, global comparative studies could be conducted with the aim of eliciting common patterns of service utilisation or cost associations for the widest range of countries, cultures and settings. As recently stated in the WHO's guidelines for cost-effectiveness analysis (Murray et al, 2000):

> 'Broader use of cost-effectiveness studies to analyse the allocative efficiency of health systems and recommend resource allocation has led to a number of challenges. It appears that the field can develop in two distinct directions, towards increasingly contextualised analyses or towards more generalised assessments'.

In their extreme form, neither position is satisfactory – context-specific studies will clearly have low generalisability, while economic studies seeking to be genuinely global are vulnerable to accusations of insensitivity and inaccuracy. For economic analysis to go beyond specific contexts, however, a more generalised approach is certainly required. Such an argument is predicated on the pragmatic, global need for cost-effectiveness information relating to health care interventions (for policy, planning and priority-setting purposes) at a time when only a handful of countries world-wide have the internal resources to generate such information for themselves.

There is therefore a need to find middle-ground between context-specific and fully generalised approaches to the economic analysis of health care. Definition of a limited set of average health system and epidemiological contexts within which comparisons are likely to be informative – grouped according to income per capita, region, or the public/private mix in financing and provision – would appear to be one logical approach worth pursuing, as suggested in this thesis (see also Murray et al, 2000). For example, it can be argued that there are sufficient overlapping health

system and socio-cultural characteristics within the five European countries of the EPSILON study to suggest that pooled, comparative analyses of the costs and needs of schizophrenia is both justifiable and of use for the future planning, financing and organisation of services in this region. By contrast, there are evidently greater problems in pooling data from all six LIDO sites, most notably for Seattle and St Petersburg, which are at extreme ends of a spectrum of service consumption and provision. Rather, there may be merit in undertaking pooled analyses of, for example, Barcelona and Melbourne, or Be'er Sheva and Porto Alegre.

The obvious concern, as made apparent from analysis in each of the source projects of the sizeable inter-site variations in health care financing and provision, is that such an approach may still be insensitive to more local socio-cultural variations or differences in the way that health care is accessed and practised in particular settings. However, the extent to which this represents a serious problem will depend on whether the derived data is to be used by a specific decision-maker faced by a context-specific set of financial and political constraints or whether it is to inform broader debates surrounding resource allocation (Murray et al, 2000). A notable example of this latter approach was the World Bank's review of *Disease Control Priorities in Developing Countries* (Jamison et al, 1993), which generated comparable cost per DALY evidence for a wide range of clinical areas and interventions, including case management of schizophrenia and bipolar affective disorder, in a (successful) bid to stimulate renewed debate on priority-setting in the health sector. Its usefulness was not so much in providing national decision-makers with accurate measures of marginal cost-effectiveness than in developing broad categories of relative efficiency at the regional level. A similar standpoint characterises the ongoing WHO programme on generalised cost-effectiveness analysis, such that interventions will be categorised into those that are highly cost-effective, those that are highly cost-ineffective and those that fall between.

In summary, there is a prevailing need for cost:outcome data to support mental health policy and decision-making at national and international levels, which argues for the usefulness of a generalised approach to the economic analysis of mental health care that can complement more context-specific research outputs.

6.4 Concluding remarks

As demonstrated throughout this thesis, economic analysis can provide new insights and valuable contributions to pressing mental health policy concerns at national and international levels. At both levels of policy, there is a need to generate economic evidence that can both inform and support resource allocation decisions regarding new or existing initiatives and interventions. There are presently many gaps in this evidence base, so a primary objective for future research activities must be to begin the task of filling in these existing gaps in knowledge. It is perhaps not surprising, but nevertheless paradoxical, that there is least evidence where arguably it is most needed, namely in assessing the impact of low-cost drugs and mental health training among primary health care workers on the currently underserved mentally ill populations of low-income countries.

The set of research methodologies and empirical findings presented in this thesis can be seen as providing a set of analytical tools and baseline estimates with which to set about filling these gaps in knowledge. While the further application of these tested methods to identified mental health research priorities is of course open to further development, it is important to emphasise the need for a comprehensive, standardised and comparable approach to data collection and reporting. Failure to do so can only weaken the validity of such information to policy-makers and consequently tarnish future demands for such data. However, the large number of completed studies with illuminating or useful findings, together with the broad methodological consensus that has been reached in the application of economic evaluation to health care, holds out the prospect of a new generation of studies that are capable of demonstrating that interventions for psychiatric disorders in diverse cultural settings are affordable, effective and can be expected to lead not only to improvements in health but also to the greater productivity of individuals, households and communities alike. Finally, it is clear that international comparative studies of mental health care pose additional challenges to the conduct of economic analysis; this points to the need for continuing refinement of techniques that allow for the culturally-sensitive assessment of economic costs, organisational structures and health-related outcomes.

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Glossary and list of abbreviations

Term	*Acronym*	*Main page references*	*Definition*
Bootstrap		56	A non-parametric approach to statistical inference involving repetitive computations to estimate a statistic's sampling distribution
Brief Disability Questionnaire	BDQ	117, 138	Outcome measure for disability status
Brief Psychiatric Rating Scale	BPRS	45, 62, 75	Outcome measure for psychotic symptoms
Camberwell Assessment of Need	CAN	45, 75	Outcome measure for assessing met and unmet service needs
Centre for Epidemiologic Studies – Depression	CES-D	87	Screening and outcome measure for depression symptoms
Client Sociodemographic and Service Receipt Inventory	CSSRI	49-51, 77	Schedule for collecting individual-level service utilisation and socio-economic data
Composite International Diagnosis Interview	CIDI	87	WHO diagnostic interview schedule
Cost of illness studies	COI	26-29	Form of economic analysis which estimates the aggregated (national) economic burden of a disease
Disability Adjusted Life Year	DALY	23-25	Summary measure of population health (life years adjusted for disability level) used to estimate disease burden and health outcome
European Service Mapping Schedule	ESMS	45, 61	Schedule for identifying and measuring levels of mental health related service categories for a defined catchment area
Global Assessment of Functioning	GAF	45, 62, 75	Outcome measure for functioning status
Generalised Linear Modelling	GLM	58, 74	Multivariate statistical analytical approach; GLM with a gamma distribution and a log-link function incorporates the logarithmic scale through a link function but fits expected values to data on the raw scale
Global Burden of Disease study	GBD	23, 25, 29	WHO/World Bank study of global causes of mortality and non-fatal health consequences of disease (DALYs)
Gross Domestic Product	GDP	95-98	Summary measure of national wealth
Hamilton Depression Rating Scale	HDRS	117, 138	Outcome measure for depression symptoms
Involvement Evaluation Questionnaire	IEQ	45	Outcome measure for family caregiving and family burden
International Classification of Diseases (version 10)	ICD-10	44, 116-7	WHO standardised classification system for coding diseases

Term	*Acronym*	*Main page references*	*Definition*
Lancashire Quality of Life Profile	LQoLP	45, 75	Outcome measure for assessing health-related quality of life
Medical Outcomes Study short-form 12	SF-12	88	Outcome measure for assessing functioning
Ordinary Least Squares regression	OLS	57-58, 70	Standard approach to regression analysis
Purchasing Power Parity	PPP	55, 93	Rates of currency conversion which eliminate differences in price level between countries, i.e. reflect *relative* prices
Quality Adjusted Life Year	QALY	24	Summary measure of population health (years lived adjusted for their quality) used to estimate outcomes of health interventions
Quality of Life Depression Scale	QLDS	88	Outcome measure for assessing health-related quality of life in depression
Schedule for Clinical Assessment in Neuropsychiatry	SCAN	44, 117	WHO diagnostic interview schedule for mental and neurological disorders
Self Report Questionnaire	SRQ	117	Screening measure for psychiatric morbidity
Verona Service Satisfaction Scale	VSSS	45	Outcome measure for assessing satisfaction with services and carer support
WHO Quality of Life scale – Brief version	WHOQOL Bref	88, 117, 138	Outcome measure for assessing health-related quality of life

Appendices

CLIENT SOCIODEMOGRAPHIC AND SERVICE RECEIPT INVENTORY (CSSRI - EU)

EU BIOMED study: Schizophrenia needs and costs

Centre ☐ **Patient study number** ☐☐☐ **Date** ☐☐/☐☐/☐☐
d d m m y y

1. SOCIODEMOGRAPHIC INFORMATION

1.1 Date of birth — Date ☐☐/☐☐/☐☐ (d d m m y y)

1.2 Sex
1 Female
2 Male ☐

1.3 Marital status *(from a legal perspective)*
1 Single/unmarried
2 Married
3 Separated
4 Divorced
5 Widow/widower
9 Not known ☐

1.4 What is your ethnic group? *(Refer to manual for assistance)*
Ethnic group _____

1.5 Country of birth *(Refer to coding sheet)*
Country ☐☐☐

1.6 Mother tongue
1 National language
2 Other language (but having good knowledge of national language)
3 Other language (and having poor or no knowledge of national language) ☐

1.7 Number of years of schooling in general education
Number of years schooling ☐☐

1.8 Highest completed level of education
1 Primary education or less
2 Secondary education
3 Tertiary / further education
4 Other general education
9 Not known ☐

1.9 What further education or vocational training have you completed or are doing now? *(Tick all boxes that apply)*

Specific vocational training (< 1 year)	☐
Specific vocational training (> 1 year)	☐
Tertiary level qualification /diploma	☐
University degree (undergraduate)	☐
University higher degree (postgraduate)	☐
Other vocational training	☐

2. *USUAL LIVING SITUATION*

2.1 What is your usual/normal living situation now?

1 Living alone (+/- children)
2 Living with husband/wife (+/- children)
3 Living together as a couple
4 Living with parents
5 Living with other relatives
6 Living with others
9 Not known ☐

2.2 What kind of accommodation is it?
(Refer to manual for definitions)

Domestic / family
1 Owner occupied flat or house
2 Privately rented flat or house
3 Rented from local authority/municipality or housing association/co-operative

Community (non-hospital)
4 Overnight facility, 24-hour staffed
5 Overnight facility, staffed (not 24-hour)
6 Overnight facility, unstaffed at all times

Hospital
7 Acute psychiatric ward
8 Rehabilitation psychiatric ward
9 Long-stay psychiatric ward
10 General medical ward

11 Homeless / roofless
12 Other _____ ☐☐

2.3 ***If domestic accommodation:***

How many adults live there? Number of adults ☐
(over the age of 18)

And how many children? Number of children ☐
(under the age of 18)

Note: ***If hospital or community accommodation:***

Complete the final sheet of the schedule after finishing this interview.

2.4 Have you lived anywhere else in the last 3 months? Yes = 1; No = 2 ☐

If yes: please complete table:

Accommodation type *(see Q. 2.2 for code)*	Number of days in last 3 months

3. EMPLOYMENT AND INCOME

3.1 What is your employment status?

1 Paid or self employment
2 Voluntary employment
3 Sheltered employment
4 Unemployed
5 Student
6 Housewife/husband
7 Retired
8 Other _____ ☐

3.2 ***If employed***: state occupation:
(Refer to manual for definitions)

1 Manager/administrator
2 Professional *(eg health, teaching, legal)*
3 Associate professional *(eg technical, nursing)*
4 Clerical worker /secretary
5 Skilled labourer *(eg building, electrical etc.)*
6 Services/sales *(eg retail)*
7 Factory worker
8 Other _____ ☐

How many days have you been absent from work owing to illness within the last 3 months?

Days absent from work ☐☐

3.3 ***If unemployed:***

Number of weeks unemployed within the last 3 months

Number of weeks ☐☐

3.4 Do you receive any state benefits?

Yes = 1; No = 2 ☐

If yes: What benefits are received?
(Please tick all boxes that apply)

International categories	***National variants***	
<u>Unemployment /income support</u>	Income support	☐
	Jobseeker's allowance	☐
<u>Sickness/disability</u>	Disability living allowance	☐
	Statutory sick pay	☐
<u>Housing</u>	Housing benefit	☐
<u>Other benefits</u>	State pension	☐
	Child benefit	☐

3.5 What is your <u>main</u> income source?

1 Salary/Wage
2 State benefits
3 Pension
4 Family support *(e.g. from spouse)* ☐

3.6 What is your total personal gross income from all sources?
(Note: if gross income not known, please give net income, i.e. after tax and other deductions)

Weekly		Monthly		Yearly		
1 Under £149	**or**	1 Less than £649	**or**	1 Less than £7,785		
2 £150 - £204		2 £650 - £885		2 £7,786 - £10,635		
3 £205 - £279		3 £886 - £1,208		3 £10,636 - £14,504	gross income	☐
4 £280 - £392		4 £1,209 - £1,699		4 £14,505 - £20,394	or net income	☐
5 More than £393		5 More than £1,700		5 More than £20,395		

4. SERVICE RECEIPT

4.1 Please list any use of **inpatient hospital services** over the last 3 months
(Note 1: please enter '0' if service has not been used; Note 2: see manual for definitions)

Service	**Admissions**	**Total number of inpatient days (over the last 3 months)**
Acute psychiatric ward		
Psychiatric rehabilitation ward		
Long-stay ward		
Emergency / crisis centre		
General medical ward		
Other _____		

4.2 Please list any use of **outpatient hospital services** over the last 3 months
(Note 1: please enter '0' if service has not been used; Note 2: see manual for definitions)

Service	**Unit of measurement**	**Number of units received (over the last 3 months)**
Psychiatric outpatient visit	Appointment	
Other hospital outpatient visit (incl. A&E)	Appointment	
Day hospital	Day attendance	
Other _____		

4.3 Please list any use of **community-based day services** over the last 3 months
(Note 1: please enter '0' if service has not been used; Note 2: see manual for definitions)

Service	**Number of attendances**	**Average duration of attendance**
Community mental health centre		
Day care centre		
Group therapy		
Sheltered workshop		
Specialist education		
Other _____		

4.4 Please list any other **primary and community care contacts** over the last 3 months *(Note 1: enter '0' if service has not been used; Note 2: see manual for definitions)*

Service	**Sector** (1 = govt; 2 = vol 3 = private)	**Total number of contacts over the last 3 months**	**Average contact time (minutes)**
Psychiatrist			
Psychologist			
Primary care physician			
District nurse			
Community psychiatric nurse / case manager			
Social worker			
Occupational therapist			
Home help / care worker			
Other _____			
Other _____			

4.5 Over the last 3 months, has the patient been in contact with the **criminal justice services**? Yes = 1, No = 2 ☐

If yes: How many contacts with the police Contacts ☐

(Note: contact = interview or stay of some hours, but not overnight)

How many nights spent in a police cell or prison? Nights ☐☐

How many psychiatric assessments whilst in custody? Assessments ☐

How many (criminal or civil) court appearances? Criminal courts ☐

Civil courts ☐

5. MEDICATION PROFILE

5.1 Please list below use of any drugs taken over the last one month:

Name of drug	**Dosage (if known)**	**Dosage frequency**	**Depot** (1 = Yes; 0 = No)
1.			
2.			
3.			
4.			
5.			

THANK YOU

CLIENT SOCIODEMOGRAPHIC AND SERVICE RECEIPT INVENTORY (CSSRI - EU)

EU BIOMED study: Schizophrenia needs and costs

HOSPITAL OR COMMUNITY ACCOMMODATION DETAILS

Centre ☐ **Patient study number** ☐☐☐ **Date** ☐☐/☐☐/☐☐
d d m m y y

Note: *This sheet should be completed as soon as possible after the patient face-to-face interview. The best source of information is likely to be a key worker or facility manager.*

1. How many beds/places in the hospital ward or residential facility are currently a) available and b) occupied?

Available beds/places ☐☐☐

Occupied beds/places ☐☐☐

2. Please complete the following staffing table *(see manual for assistance)*:

Care staff category *(Note: only one category per staff member)*	**Number of 'full-time equivalent' posts**	**Total annual cost of care staff category**
Staff with a medical qualification		
Staff with a psychology qualification		
Staff with a nursing qualification		
Staff with a social care qualification		
Staff with no care qualification		
Vacant care staff positions		
All care staff categories (total)		

3. What is the annual recurrent cost of the facility, excluding care staff?, *(Include catering, cleaning, etc., but exclude rent and capital costs; See manual)*

Total cost per year £ _____

4. What is the average weekly charge or fee per resident place/bed? *(See manual for definition)*

Charge per week £☐☐☐☐

5. Who contributes towards the full cost of this accommodation? *(Tick all boxes that apply)*

National government (health service/insurance fund) ☐
Local government ☐
Voluntary organisation/charity ☐
Private organisation/company ☐
Private individual ☐

Client Sociodemographic and Service Receipt Inventory (CSSRI - EU)

MANUAL

Introduction

This manual has been developed for use by participants in the EU BIOMED study of schizophrenia in 5 European countries. The Client Sociodemographic and Service Receipt Inventory (CSSRI - EU) is one of five instruments that are being used to measure the needs, quality of life and cost of schizophrenia in each participating centre. The manual provides explanatory notes for particular questions or items in the schedule that require some additional information, definition or guidance.

Instrument overview

The CSSRI - EU brings together questions which allow the comprehensive costing of care packages for individual patients or clients with schizophrenia. It does this by collecting information on the current living arrangements and expenses of the client (including income, employment and accommodation), followed by questions about any use the client may have made of a range of health care, social care and other services over a defined retrospective period. A profile of each client's medication is collated in a similar way. Unit costs for each of these services and drugs are calculated (as a separate exercise) and subsequently applied to the resource use data from the CSSRI - EU, to give the total costs associated with each client's use of services and medication. The instrument is also used to collect key sociodemographic data. There are also costs associated with the informal care inputs by family members and friends, which we are obtaining from one of the other instruments in the study.

Contact point

If you have any queries regarding the meaning of any items, or are unclear about how to complete any aspect of the instrument, please contact Daniel Chisholm or Martin Knapp at the Centre for the Economics of Mental Health, Institute of Psychiatry, 7 Windsor Walk, London SE5 8BB, UK. Tel: + 44 171 919 3503; Fax: + 44 171 701 7600; e-mail: cemh@iop.bpmf.ac.uk

Section by section explanatory notes

Frontpage : Patient's confidential details

This frontpage is to be completed at the beginning of the patient face-to-face interview. It should be stored securely in a separate location to the completed interviews. This is in order to preserve the confidentiality of the subjects surveyed in this study.

Centre number: Each participating centre has a numbered code:
1 = Amsterdam; 2 = Copenhagen; 3 = London; 4 = Santander; 5 = Verona

Patient number: Please ensure that this is recorded before the interview starts.

Q. 4 **Date of birth**: Complete both here on front page and on the main instrument (Q 1.1) so that subjects can be traced if the study number is illegible.

Section 1 : Sociodemographic information

Q. 1.4 **Ethnic group**: It has not been possible to generate a coded shortlist of possible ethnic groups into which subjects will fall, since the study covers five countries, each with its own historical, political and cultural heritage.

Definition of ethnicity = 'shared origins, social background, traditions or culture that lead to a sense of identity and group' The ethnic group of most patients will be best described as 'White European'. Other possibilities include 'African-Caribbean', 'Sikh', 'Chinese', etc. Ethnicity is NOT to be confused with race (race = division of humankind by *physical* characteristics).

Q. 1.5 **Country of birth**: is an objective (but potentially crude) index of ethnicity. A coding sheet for countries is attached to the back of this manual. Please include the number code for the country.

Q. 1.7 **Years of schooling**: start point = beginning of compulsory (free) schooling.

Section 2 : Living situation

Q. 2.1 **Usual living situation**: Please identify with the patient his/her usual or normal place of residence. *Definition of children* = under the age of 18.

Q. 2.2 **Type of accommodation**: This item attempts to provide a simple classification of possible types of accommodation in which patients are residing. Some of the categories are (necessarily) broad in order to allow comparisons between centres to be made.

The following definitions should be employed for specialist community and hospital accommodation:

Community (non-hospital residential facilties):

Overnight facility, 24 hour staffed: Facility where a member of staff is present on site 24 hours a day, with responsibilities related to the monitoring and clinical and social care of patients (i.e. domestic or security staff are not included).

Overnight facility, staffed (not 24 hour): Facility where a member of staff is regularly on site at least three days a week for some part of the day, with responsibilities related to the monitoring and clinical and social care of patients.

Overnight facility, unstaffed: Facility where there is no regular staff presence (less than three days per week), i.e. staff are present only occasionally in the week, either as visits or in reponse to particular care needs.

Hospital:

Acute psychiatric ward: Acute facility to which patients are routinely admitted because of a deterioration in mental state, behaviour or social functioning which is related to psychiatric disorder.

Rehabilitation ward: Non-acute facility to which patients are referred, usually for a fixed maximum period of residence.

Long-stay ward: Non-acute facility to which patients are referred, usually for an indefinite period.

General medical ward: Facility whose core function is the care of inpatients outside the speciality of psychiatry.

Note: **If hospital or (specialist) community accommodation**: It is necessary to complete the supplementary page of the schedule (after the interview with patient), which asks for facility staffing and financial details. See p. 5 below.

Section 3 : Employment and income

This section is aimed at getting information on patients' employment and income circumstances. It is an important source of information for establishing the knock-on effects (or indirect costs) of schizophrenia, such as lost ability to work, and also for estimating the living expenses of the patient.

Q. 3.2 **Occupational categories**: The categories are based on the International Standard Classification of Occupations (ISCO), a copy of which is attached. (Please note that ISCO categories 6,9 and 0 have been dropped from the list at Q. 3.2 and should be identified at 'Other....' on the schedule if applicable.)

Q. 3.4 **State benefits**: The approach taken here has been to identify a number of international categories of benefits/entitlements, and to have a list of national variants that fall under these broad international categories. This meets the

dual requirement of making consistent comparisons between centres whilst building up a set of data that has most meaning and use in each individual site.

Q. 3.6 **Personal income**: We have attempted to reduce the sensitivity of questions about personal income by offering a number of possible income bands. The income bands can be shown to patients on a separate card, who can than be asked to point to the number of the band which corresponds to their total personal income (per week, per month or per year - it does not matter which, each amounts to the same income *level*). If at all possible, this should be given as a gross income level, i.e. *before* tax and other deductions, but if this is not possible, the net income level can be inserted (i.e. *after* tax and other deductions). Please note that this question is asking for the income of the patient, NOT household income.

Section 4 : Service receipt

Note: All service receipt is being collected over a retrospective period of 3 months.

Q. 4.1 **Inpatient hospital services**: Please see above for definitions of hospital services. Please record *all* days in these facilities, *including* if the patient was identified at Q. 2.2 as currently living in one of these settings.

Q. 4.3 **Community-based day services**: These are services which are normally available to several patients at a time and which usually provide some combination of treatment for problems related to mental illness, structured activity, social contact and/or support. Facilities have regular opening hours.

Q. 4.4 **Primary and community care contacts**: These are services which involve contact between health and social care professionals and patients for some purpose related to management of mental illness and its associated clinical and social difficulties. They are provided separately, i.e. do not form part of the delivery of residential or day services.

Please identify the sector from which the service contact is delivered (1 = Statutory/government; 2 = voluntary; 3 = private). If there is a mixture of sectors for any given contact type, indicate the main sector of provision.

Q. 4.5 **Criminal justice services**: Please code 9 if number of police contacts, nights in custody, psychiatric assessments or court appearances not known.

Section 5 : Medication profile

Q. 5.1 **Medication**: Please record all drugs taken, not just those related to mental illness. Please code 9 if dosage not known, otherwise give volume per unit of measurement (e.g. 5 mg).

Supplement : Hospital/community accommodation details

The final page of the schedule only needs to be completed for patients who are resident in hospital or specialist community settings (rather than domestic accommodation). Data should be collected after the face-to-face interview, in consultation with a facility manager or senior key worker. We recommend that time is made available as soon after the patient interview as possible.

Note: For study patients who reside in the same facility, the accommodation details will only need to be obtained once. However, please ensure that accommodation details are recorded on each patient's schedule.

Q. 1 **Number of places/beds**: Please give the number of places in the residential facility or hospital ward that are both currently available and occupied.

Q. 2 **Staffing**: Please include all staff involved in the direct care and management of patients. The number of full-time equivalent (FTE) staff is calculated by aggregating all full-time and part-time positions and expressing them in terms of full-time posts. For example, a facility with 4 full-time posts and 4 posts working half-time would have a FTE count of 6. The total annual cost of the various categories of staff should include actual salaries only (salary on-costs, such as national insurance, will be calculated separately by CEMH).

Q. 3 **Recurrent cost (excluding care staff)**: Apart from the salaries of care workers, there are other revenue or recurrent costs involved with operating the facility. Using annual accounts (if available), please identify the annual costs associated with catering and cleaning staff and consumables, heating and lighting, transport etc. For hospital wards, an apportionment of the overall hospital recurrent costs (excluding care staff) may be the best estimate possible.

Note: There are also likely to be other costs, such as rent, capital or overheads. These are a relatively small proportion of the overall cost and will be calculated separately by CEMH. Please do NOT include these costs in this question.

(If you do have useful information about these costs that you can share with us, please contact Daniel Chisholm at CEMH.)

Q. 4 **Charge per week**: Charge refers to the fee or price that is payable in the market for residential care. It is often different to the actual cost of resources involved in residential/hospital care (staffing, running costs etc.). For example, a private, for-profit company may charge a fee above what it actually costs to provide care. Fees or charges for a place at a facility are often available, and are useful where it is difficult to estimate the true cost.

THANK YOU FOR YOUR VALUABLE HELP IN THIS STUDY

Longitudinal Investigation of Depression Outcomes (LIDO):

Local socio-demographic and service profile

Background

[Source: Socio-demographic Schedule]

1. Name of participating site (country)

2. For which local health service catchment area are you answering this questionnaire?

   (Note: a profile must be completed for each area from which study subjects are being recruited)

3. What year do your responses relate to? **19**

   (Note: if data taken from more than one year, state most commonly used year)

4. How many inhabitants does the local health service catchment area have?

5. What is its size? **km^2**

6. How would you best describe its predominant character? Choose from:

   - metropolitan
   - urban
   - suburban
   - rural
   - mixed (specify) _____

7. How is the catchment area defined?
   (e.g. local government area boundaries, health service sector etc.)

Socio-demographic profile

[Source: Socio-demographic Schedule]

			Locally		Nationally	
			Male	**Female**	**Male**	**Female**
8.	Please give the percentage of total population in each age category *(Note: give the exact years that are reported in your country)*					
•	Children (0-18):	0 - years	%	%	%	%
•	Young adults (19-39):	- years	%	%	%	%
•	Older adults (40-65):	- years	%	%	%	%
•	Retired (65 +):	years or more	%	%	%	%
			100 %		100 %	
9.	Please give the percentage of people over school leaving age in each employment category					
•	Employed (including part-time)		%	%	%	%
•	Unemployed		%	%	%	%
•	Other economically inactive (including housewives, students, retired and permanently sick)		%	%	%	%

		Locally	Nationally
10.	What % of people over school leaving age are not married (i.e. single, widowed, divorced etc.)?	%	%
11.	What % of people over school leaving age are living alone, with no adults and no dependents?	%	%
12.	What % of people over school leaving age are living alone as a single parent, with children?	%	%
13.	What is the death rate per 100,000 people for all causes and all ages?		
14.	What is the death rate per 100,000 people for all causes for people aged under 65 years?		

Overview of health care system

15. Please give a brief description (typed in English) of the health care system in your country, including: a) the basic organisation and structure of services; b) the delivery / provision of services; and c) financing of / payment for services:
(An example of a completed profile is attached for your assistance)

16. Please circle the cell number which describes your country best and estimate the proportion of public versus private financing and provision of health care:

		Financing of health care			
		Public		Private	
Provision of health care	Public	%	(1)	%	(2)
	Private	%	(3)	%	(4)

Secondary care services

[Source: Service Mapping Schedule]

- services refer (except Q. 17) to the catchment area's or country's population of adults who have mental and behavioural disorders. For Q. 17, it is the whole adult population, not just those with mental disorders. In both cases, please *exclude* services for children and adolescents (aged less than 18 years, or the close equivalent in your country), and *include* services for the elderly.

- when estimating mental health service levels, please *exclude* services for people with learning difficulties (mental handicap), but *include* people with organic mental disorders and substance misuse disorders.

- services outside the local catchment area which routinely deliver services to the catchment area population should be *included*

- services provided by health service, social services, voluntary sector and private sector providers should *all* be *included* (e.g. private as well as public hospital beds)

- service use per 100,000 adult population (over 18 years, or the close equivalent in your country) should be calculated by dividing total identified beds/places by the total local / national population over 18 years old and then multiplying by 100,000

	Locally	**Nationally**
17. How many medical (non-psychiatric) hospital beds per 100,000 people aged over 18 years? Note: *include* all medical specialities except psychiatry, including medical care beds for the elderly)		
18. How many psychiatric hospital beds per 100,000 people aged over 18 years? Notes: *include* all secure, acute and non-acute beds; *include* secure beds in prisons; *include* psychiatric beds in general hospitals		
19. How many non-hospital residential places for the mentally ill per 100,000 people? Note: *include* all accommodation outside hospital grounds/prison specifically designated for people with mental illnesses (hostels, group homes etc.)		
20. How many places per 100,000 people for day services/activities for the mentally ill? Note: *include* day hospital places and community facilities available for users to attend for at least the equivalent of four half days per week; *exclude* employment / work-related schemes		

Primary care services

[Source: WHO PPGHC Study Form 43]

Note: Please complete a profile for each participating primary care centre in your site.

21. **Name** of primary care centre

22. **Setting**: Urban; Rural; Other *(specify)*

23. Total number of full-time equivalent **physicians**
(Note: express part-time posts as full-time equivalents)

24. Total number of full-time equivalent **nurses**
(Note: express part-time posts as full-time equivalents)

25. Total number of full-time equivalent **other staff**
(Note: express part-time posts as full-time equivalents)

26. Average length of a **typical visit** minutes
(Definition: face-to-face contact with a physician)

27. Total number of **patients** per month (on average)?
(Note: please adjust for seasonal variations)

28. Percentage of patients in each **age category**
(Note: give exact age bands that are available)

				Male	***Female***
• Children (0-18):	0	-	years	%	%
• Younger adults (19-39):		-	years	%	%
• Older adults (40-65):		-	years	%	%
• Retired (65 +):		years or more		%	%
				100 %	

29. Please estimate the distribution of attenders' **reasons** for visits:

- acute illness and injuries ____ %
- definite chronic diseases ____ %
- indefinite/ill-defined chronic symptoms ____ %
- psychological problems ____ %

30. What percentage of attenders live within 30 minutes **journey** of the primary care centre? ____ %

31. **Transportation** to the primary care centre:

- easy ____ %
- with some difficulty ____ %
- difficult ____ %

32. Who **pays** for the patient's visit?
(a) patient/family; b) health service; c) combination

33. Who **pays** for the patient's medications?
(a) patient/family; b) health service; c) combination

34. Do patients easily **access** care in an organised way (appointment system)? Yes No

35. Do doctors or clinics have well-kept, detailed **records** of patients? Yes No

36. Are physicians 'personal doctors'?
Does the patient usually see the same doctor? Yes No

37. Do physicians assume responsibility for **coordination** of patients' follow-up, referral and other services? Yes No

THANK YOU

Appendix C

A Few More Questions About You

1. What is your current marital status ? *Please circle the number of your answer.*

   1 MARRIED OR LIVING AS MARRIED
   2 WIDOWED
   3 SEPARATED
   4 DIVORCED
   5 NEVER MARRIED

2. What is your current living situation? *Please circle the number of your answer.*

   1 LIVING ALONE
   2 LIVING WITH SPOUSE/PARTNER ONLY
   3 LIVING WITH SPOUSE/PARTNER AND CHILDREN
   4 LIVING WITH OTHER RELATIVE(S)
   5 LIVING WITH OTHER(S) (NOT RELATED)
   6 OTHER, SPECIFY _____

3. What is the highest grade or year of school that you have completed? *Please circle your answer.*

0 1 2 3 4 5 6 7 8	9 10 11 12	13 14 15 16	17 18 19 20+
ELEMENTARY SCHOOL	HIGH SCHOOL	COLLEGE *Circle 14 for vocational school*	GRADUATE OR PROFESSIONAL SCHOOL

4. Please indicate the type of living accommodation that describes you best.
   Please circle the number of your answer.

   1 OWNER OCCUPIED APARTMENT, FLAT, CONDOMINIUM OR HOUSE?
   2 PRIVATELY RENTED APARTMENT, FLAT, CONDOMINIUM OR HOUSE?
   3 APARTMENT, FLAT, CONDOMINIUM OR HOUSE RENTED FROM A PUBLIC AGENCY
   4 OTHER TYPE OF LIVING ACCOMMODATION (DESCRIBE: _____)

5. Please indicate the employment status that describes you best. *Please circle the number of your answer.*

   1 PAID OR SELF-EMPLOYED
   2 VOLUNTARY EMPLOYMENT (NO FINANCIAL COMPENSATION)
   3 SHELTERED OR SUBSIDIZED EMPLOYMENT
   4 UNEMPLOYED
   5 STUDENT
   6 HOUSEWIFE/HUSBAND
   7 RETIRED

Appendix C

6. If unemployed, for how many weeks within the last 3 months? _____ *Number of weeks*

7. If employed, please indicate the occupational status that describes you best.
Please circle the number of your answer

1 MANAGER/ADMINISTRATOR
2 PROFESSIONAL (HEALTH, TEACHING, LEGAL, ETC....)
3 ASSOCIATE PROFESSIONAL (TECHNICAL/VOCATIONAL)
4 CLERICAL WORKER/SECRETARY
5 SERVICES/SALES
6 SKILLED LABORER (BUILDING, ELECTRICAL, ETC....)
7 UNSKILLED LABORER (FACTORY WORKER)
8 ARMED FORCES (FULL TIME)

8. In the last 3 months, how many days have you been absent from work? _____ N*umber of days*

9. Please indicate the main source of income that describes you best. *Please circle the number.*

1 SALARY
2 STATE BENEFITS
3 PENSION
4 FAMILY SUPPORT (I.E. SPOUSE)
5 OTHER: _____

10. What is your <u>total</u> personal income from all sources? If possible give gross income before taxes and deductions. _____ *Total personal income*

Please circle your answer.

Is this income: WEEKLY MONTHLY ANNUAL

Is this income: GROSS NET

11. In the last 3 months, have you been counseled or given medications for the treatment of depression? *Please circle your answer.* Yes No

12. Do you expect to be moving away from this area in the next twelve months? *Please circle your answer.* Yes No

Thank you very much for completing this survey. Please look through it once to see that it is complete, and then hand it to your interviewer.

Use of Health Care Services

Now I am going to ask you about the primary care and outpatient visits you have had during the last 3 months (these include any home services, emergency room visits, or diagnostic tests you have had).

During the past three months, have you had visits to any of the following health care providers?	*(Circle)* **No Yes**	**How many visits did you have during the past three months ?**	**Where did these visits usually take place?** *1 = hospital outpatient 2 = primary care center 3 = emergency room 4 = private clinic/practice 5 = your own home*	**On average, about how long were these visits?** ***Number minutes***
1. Primary care doctor (MD/DO)	0 1	# visits		# minutes
2. Other health care worker (nurse practitioner, PA, MSW,PT)	0 1	# visits		# minutes
3. Psychiatrist	0 1	# visits		# minutes
4. Psychologist or other therapist (independent practitioners)	0 1	# visits		# minutes
5. Other mental health worker (such as a care manager, community services worker or social worker)	0 1	# visits		# minutes
6. Other non-mental health specialist physician or dentist	0 1	# visits		# minutes
7. Alternative therapies (regardless of delivery by a physician)	0 1	# visits		# minutes
8. Other *specify* (include diagnostic services by technician and ambulance service) _____	0 1	# visits		# minutes

Next I will be asking you about any day services or day care activities that you might have used during the past three months, including group therapy, day treatment, or day surgeries?

During the past three months, have you used any of the following services?	*(Circle)* **No Yes**	**How many times did you use those services during the past three months?**	**On average, how long did you use each service?**
9. Day hospital for physical health (including day surgery, oral surgery, dialysis,)	0 1	# times	# hours
10. Day hospital for mental health (like group therapy, day treatment, partial hospitalization)	0 1	# times	# hours
11. Day care in community-based program for mental health (like occupational therapy, group therapy, adult day care, senior center programs)	0 1	# times	# hours
12. Other community-based non mental health day programs or services, including AA, and other support groups (*specify)* _____	0 1	# times	# hours

SITE ID — PATIENT ID

For the next part, I am going to ask you about any stays you had in a hospital as an inpatient.

During the past three months, have you used any of the following types of inpatient services?	***(Circle)*** **No Yes**	**How many separate admissions did you have over the past three months ?**	**In total, how many days did you spend in this type of facility?**
13. Psychiatric hospital ward	0 1	# admissions	# days
14. Psychiatric ward of general hospital	0 1	# admissions	# days
15. Medical ward of general hospital	0 1	# admissions	# days
16. Emergency ward psychiatric facility	0 1	# admissions	# days
17. Emergency ward general facility	0 1	# admissions	# days
18. Other *specify* _____	0 1	# admissions	# days

19. Now, please can you tell me what prescribed medications you have been taking during the past three months? [***Interviewer: Ask to see patient's medication bottles.] [ALL medications]***

Name of medication	**Strength of dose (mg.)**	**Number pills per dose**	**Dose Frequency**	**How many weeks out of the past three months have you been taking this medication**
a.				# weeks
b.				# weeks
c.				# weeks
d.				# weeks
e.				# weeks
f.				# weeks
g.				# weeks
h.				# weeks

Do you feel that your treatment or use of services is affected by any of the following:

Circle one response per question

20. The place you need to go to for treatment is far away or inconvenient to get to..... Yes No
21. Seeking treatment might compromise my job opportunities..... Yes No
22. The costs or charges that you pay towards treatment/medicines are not affordable. ..... Yes No
23. Asking for treatment or attending a treatment center can feel embarrassing. ..... Yes No
24. Family and/or friends discourage you in some way from seeking or getting treatment. ..... Yes No
25. Taking medication sometimes makes you feel unwell or causes side-effects..... Yes No
26. Are there other reasons that would cause you to not make use of health care services?..... Yes No

(*specify)*

Longitudinal Investigation of Depression Outcomes (LIDO)

UNIT COST PROTOCOL

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1. Introduction

This protocol has been developed for use by local site investigators and collaborating economists in the Eli-Lilly sponsored Longitudinal Investigation of Depression Outcomes (LIDO), the aim of which is to study the QoL and economic correlates of recognized major depression in primary care. The protocol sets out the scope, principles and procedures of the unit cost data collection exercise to be conducted in each participating site. The information contained in this document will be presented to local site investigators and collaborating economists by a member of the co-ordinating agency (HRA) or an Advisor to the study with special expertise in health economics and service costing.

Adherence to this protocol is particularly important in an international study of this kind in order to ensure that a standardised approach has been adopted across sites. The templates that can be found in the Appendices have been prepared in order to ensure this standardised approach, as well as to assist you in what can be an onerous task! Please complete <u>all</u> templates and return to the contact point below.

2. Scope of exercise and principles of costing

The broad perspective to be employed in the costing of services is an economic one, such that in principle service costs are derived by reference to their *marginal long-term opportunity costs* (see Knapp, 1995 for an overview of this theoretical framework in relation to mental health care) For example, the opportunity cost of an inpatient hospital bed is in principle to be based on established calculations of how

those resources could be used in their best alternative use, such as a day care place or an entirely different service within or outside mental health care.

In practice, derivation of costs in this way is difficult. It is therefore conventional to use *short-term average costs as a proxy* for long-run marginal costs (Beecham, 1995; Beecham and Knapp, 1992). There is widespread consensus in health economics as to the validity of these proxies, provided that necessary adjustments such as the inclusion of capital in a unit of service provision are made (see Chisholm et al, 1997 for a practical application to mental health residential care; see Netten and Dennett, 1997 for a wide range of UK unit costs of health and social care derived in this way).

Economic or opportunity costs are *not* the same as market prices, charges, fees or per diems. Profit motives, varying accounting and reimbursement practices mean that the use of per diems and hospital charges are unlikely to represent a good proxy of opportunity cost. For example, a private, for-profit company may charge a fee above what it actually costs to provide care. Where used (because no other data possible to collect), they should be explicitly justified and, if necessary, adjusted to reflect the real economic cost.

Estimation of costs should either be based on local catchment area data, or if this is not possible, on national data so long as the local catchment area is typical or representative of the national picture. As a general rule, the unit cost of contacts with primary care workers or outpatient consultants are not likely to vary significantly (making national estimates an acceptable choice), whereas the unit cost of day care provision and particularly inpatient services may vary considerably between different areas of the country. Facility-specific estimates should be obtained if possible. A further general principle is that routinely collected data are preferable to data collected on a one-time basis.

A further principle of cost evaluation is that the resource implications of *all* elements of a service should be considered, even though individual service planners may only be interested in the cost to their own agencies. Again, there are difficulties in realising this principle on pragmatic grounds; for instance, the full cost of a day care place may

include inputs from unpaid volunteer staff or financial contributions from clients over and above those of the managing agency.

In *this* study, the following direct and indirect costs are to be included:

- *direct costs*: refer to the costs of health and social care services provided for the care and support of people with depression. These services are itemised in the interview schedules at Baseline and subsequent follow-up assessment points under the section 'Use of Health Care Services', to which it will be necessary to attach unit costs.

- *indirect costs*: refer to the wider-reaching economic effects of depression, and in particular to foregone opportunities for employment. Data is being collected on weeks off work (for people normally employed) and weeks of unemployment as part of the self-completed schedule under the section 'A Few More Questions: About You'. Estimates of the indirect costs of lost employment will be calculated by multiplying days off work by the local wage rate for the occupational category of the patient.

There are other indirect costs, such as reduced productivity whilst at work or informal care support, but these are outside the scope of this particular study (largely due to measurement difficulties).

3. Unit cost data collection and calculation

Constructing a profile of the service costs requires the combination of two sets of data, the first of which is information on service utilisation - to be collected as part of the interview schedule at Baseline and subsequent assessment points. For each of the service components described - and this is the second set of data - an estimate of the cost associated with the provision of a unit of service provision is needed.

The appropriate unit of analysis differs across the service components (for example, hospital inpatient beds are usually described in daily units, whereas contacts with primary care workers are expressed in terms of number (and average duration) of visits. For the purposes of subsequent data analysis, costs will be converted into the same time frame (cost per year).

There are four main categories of cost that need to be quantified for each service:

1. Salaries and wages of staff employed in the direct care and management of patients
2. Facility operating costs where the service is provided (cleaning, catering etc.)
3. Any overhead costs relating to the service (personnel, finance etc.)
4. The capital costs of the facility where the service is provided (land, buildings etc.)

This last category of cost needs particular explanation. The (opportunity) cost of capital is conventionally calculated as the annuity (the constant stream of payments arising from interest, taken to be the best alternative use for the capital) which will deplete the lump sum value or expenditure over the lifetime of the capital. The lifetime of land and buildings is normally set at 60 years, and the lifetime of equipment (including furniture and vehicles) is normally set at 10 years. The other determining feature of the annuity factor is the prevailing discount rate for public and/or private capital assets. The general formula for deriving the annual capital cost of an asset (annuitising rate, denoted $a^{-1}{}_{n}$) is $r/1-(1 + r)^{-n}$, where r is the discount rate and n is the lifespan of the asset. A number of annuity factors relating to different discount rates are given below for easy reference:

Asset	**Lifespan**	**Discount rate**				
		3%	**5%**	**7%**	**10%**	**15%**
Land and buildings	60 years	0.0361	0.0528	0.0712	0.1003	0.1500
Equipment and vehicles	10 years	0.1172	0.1295	0.1424	0.1627	0.1992

Example: Using the 5% discount rate, a day care centre worth $500,000 would have an annual capital cost of $26,400 (500,000 x 0.0528)

3.1 Primary care and outpatient visits

Estimates of the unit cost of health care and social care professionals are needed for the section on 'Use of Health Services', questions 1-7. We need to arrive at a unit cost per minute of consultation time with these professionals. The main categories of information required to calculate this unit cost are:

- **wages/salary**: salary costs can normally be obtained from local or national pay scales. The ideal salary value to use is a weighted average of all grades on a pay scale.

- **salary on-costs**: this covers employer contributions to local/national taxes, pension or health insurance schemes etc., and can be given as a percentage add-on to the salary/wage. An indication of the basis of the percentage add-on should be given.

- **revenue overheads**: this covers the costs associated with running the establishment where the professional is employed, for example a primary care clinic. This can be worked out by dividing *pro rata* the total running costs of the establishment (*excluding capital costs or rent)* by the total number of 'full-time equivalent' staff (see below for definition), and can be expressed as a percentage add-on to the salary.

- **capital overheads**: refers to the costs associated with the buildings, land and equipment of an establishment. This can be worked out by dividing *pro rata* the annuitised capital costs of the establishment by the total number of full-time equivalent staff, and can also be expressed as a percentage add-on to the salary.

- **travel costs**: refers to the typical cost of travel, which is particularly relevant for professionals who make home visits.

In order to reach a unit cost per minute of contact time, the aggregate of these cost components needs to be divided by the typical working time of the professional (for

example, 35 hours per week, with 4 weeks holiday per year and 1 week sickness leave allowance). Because these professionals do not spend all their time with patients, it is also desirable to estimate the ratio of direct : indirect contact time with patients (for example, for every 1 hour spent face-to-face with a patient, a social worker may spend 1.5 hours doing other things such as administration, staff supervision, etc.).

A blank template has been prepared for calculating the unit cost of <u>each</u> professional identified in items 1-8 of the 'Use of Health Services' section of the interview. Notes/comments should be given in English.

3.2 Day services / day care activities

The calculation of cost for a unit of day service provision (items 9-12 of Use of Health Services schedule) requires quantification of the following components:

- **revenue costs (salaries)**: an estimate is required for the cost of all *care* staff involved in the direct care and management of patients. Staffing should be calculated as the number of full-time equivalent (FTE) staff, which is calculated by aggregating all full-time, part-time and sessional positions and expressing them in terms of full-time posts. For example, a facility with 4 full-time posts and 4 half-time posts would have a FTE count of 6. The total annual cost of the various categories of staff should include actual salaries paid to staff and a percentage for on-costs (which covers employer contributions to occupational schemes etc.).

- **other revenue costs**: this covers the costs associated with running the establishment where the day service is provided, including heating, lighting, catering/cleaning personnel and consumables etc. These costs can be taken from the establishment's expenditure accounts (if available) or if accounts are not available, it may be possible to use the typical fee or charge as a basis for calculation. *It is important that all rental costs are removed from this calculation.*

- **agency overheads**: refer to any costs associated with service management and administration, such as finance and personnel functions. For example, the management of a single day care facility's human and financial resources may be carried out by a headquarters office with many other facilities under its management. These costs are often difficult to identify with accuracy, and it may only be possible to establish a percentage add-on to known revenue costs. An indication of the basis for the percentage add-on should be given.

- **capital**: refers to the economic costs associated with the buildings, land and equipment of an establishment.

Derivation of the cost per hour of day care support/activity is complicated by the fact that multiple activities/functions may be offered at the same facility. In order to arrive at a basic estimate, it is proposed that total identified costs associated with the facility (usually annual costs) should be divided by i) the number of days per year that the facility operates, ii) the average number of opening hours per day and iii) the average number of clients who attend each day the facility is open to users. Specific unit costs by different types of activity and/or client group would require more detailed costing.

A blank template has been prepared for calculating the unit cost of <u>each</u> day care setting (items 9-12 of the 'Use of Health Services' section of the interview).

3.3 Hospital inpatient services

The calculation of hospital inpatient service costs (items 13-18) has the same components as that for day care activities. However, a hospital is made up of many departments / wards. It is therefore likely that apportionment of hospital-wide costs to specific wards will be necessary. The unit cost for each of the hospital inpatient services identified in the interview should best reflect local circumstances. In other words, a calculation may be required for *each* hospital commonly used by the local population / patient sample (i.e. more than one template may need to be completed). The main cost components are:

- **revenue costs (salaries)**: an estimate is required for the cost of all *care* staff involved in the direct care and management of patients on the ward. Staffing should be calculated as the number of full-time equivalent (FTE) staff. The total annual cost of the various categories of staff should include actual salaries paid to staff and a percentage for on-costs (which covers employer contributions to occupational schemes etc.). A template is given in the relevant appendices to assist in this calculation.

- **other revenue costs**: this covers the costs associated with running the ward, including heating, lighting, catering/cleaning personnel and consumables etc. It may be necessary to apportion a percentage of the total running costs of the hospital to the particular ward. If the typical fee or charge is used as a basis for calculating this element, its components should be identified clearly.

- **agency overheads**: refer to costs associated with service management and administration, such as finance and personnel functions. These costs are often difficult to identify with accuracy, and it may only be possible to establish a percentage add-on to known revenue costs.

- **capital**: refers to the economic costs associated with the hospital buildings, land and equipment. The annual capital cost of a specific ward can be established by apportioning a percentage of the total capital value of the hospital and then transforming this figure into an annual amount using an appropriate annuity factor.

Unit costs for inpatient services need to be expressed in daily units, requiring the division of the aggregated annual costs by i) the number of days in the year (365), and ii) the number of beds on the ward. A blank template has been prepared for calculating the unit cost of each inpatient service (items 13-18 of 'Use of Health Services').

3.4 Medications

A profile of each patient's medication is being recorded (item 18 of the 'Use of Health Services' section of the interview schedule). Unit costs will be required for *all* drugs listed by patients (not just psychotropic agents). The full list of drugs used will only be available at the end of data collection, but before this time point it is recommended that unit costs of all anti-depressant drugs available locally should be calculated. Unit costs should be taken from the national or local formulary of medications. Alternatively, it may be necessary to consult with local hospital pharmacies regarding the cost of certain drugs. The unit of measurement for all drugs should be expressed as *cost per 100mg*. Example: the medication cost of an individual who has taken a prescribed dose of 20mg of Fluoxetine per day for 10 weeks @ US$5 per 100mg = $70.

4. Other required socioeconomic data

In addition to the collection of unit costs for particular service components, there is also a need for other specified socioeconomic data, either to inform the interpretation of study findings or to enable other economic costs of depression to be calculated.

4.1 Wage rates by occupational category

Under the demographics section of the self-complete schedule at baseline and subsequent assessment points ('A Few More Questions - About You'), study participants are asked to indicate their occupational category (item 7). These categories have been taken from the International Standard Classification of Occupations. In order to derive the opportunity cost of lost employment due to illness, an estimate of the average wage for each of these occupational categories is required. Wage statistics are expected to be available from national or local statistical offices. However, it is anticipated that there not be precise data for the categories specified in the schedule. Please provide the best/closest estimate possible for each of these categories. The rate should be expressed as a *gross* wage/salary per year (before tax and deductions).

4.2 Distribution of national income / wealth

Under the demographics section of the self-complete schedule at baseline and subsequent assessment points ('A Few More Questions - About You'), study participants are also asked to indicate their income level (item 10). In order to place given values within the context of the national distribution of income, it is proposed that this distribution is sought from each participating site. The distribution of income should be available from national statistical offices, and should be expressed as equal percentages (or quantiles). The particular quantile required in this study is the quartile (equal bands of 25%), or the nearest equivalent in your country.

Service Utilisation Questionnaire

Patient identification ☐☐☐-☐☐☐-☐ (Patient No.) **Date** ☐☐/☐☐/☐☐ (d d m m y y) **Assessment time point** 1 = Time 1; 2 = Time 2 ☐

1. Please record any contacts the patient has had with the following health care services <u>in the last 8 weeks</u> (see manual for help in completing this form)

Health care service	*(circle)* 0 1	*Where (normally)?* 1 = hospital inpatient ward; 2 = hospital outpatient dept; 3 = community health centre; 4 = private practice; 5 = your own home		*Total contacts (in last 8 weeks)*	*Travel time (mins / visit)*	*Travel expenses (per visit)*	*Contact time per visit*	*Average fee per day / contact / test (if applicable)*
Inpatient care		*Code*	*Name*					
A. Hospital inpatient care (psychiatric)	No Yes			*Days*			N/A	
B. Hospital inpatient care (non-psychiatric)	No Yes			*Days*			N/A	
Day care / group support activities								
C. Day care / <u>group</u> support activities *(e.g. occupational & art therapy)*	No Yes			*Attendances*			*Hours*	
Outpatient and primary care								
D. Psychiatrist (outpatient)	No Yes			*Contacts*			*Mins*	
E. Primary health care / family doctor	No Yes			*Contacts*			*Mins*	
F. Other doctor / physician (e.g. surgeon)	No Yes			*Contacts*			*Mins*	
G. Psychologist or other <u>individual</u> therapist *(e.g. counsellor)*	No Yes			*Contacts*			*Mins*	
H. Nurse (outpatient or community)	No Yes			*Contacts*			*Mins*	
I. Other mental health or social worker	No Yes			*Contacts*			*Mins*	
J. Traditional healer / indigenous practitioner	No Yes			*Contacts*			*Mins*	
K. Other (specify) *(e.g. Lab tests, ECT)*	No Yes							

2. Does the patient feel that access to / use of services is affected by these factors? (tick one box only)

	No	Yes +vely	Yes -vely
A. Your present state of health / perceived need for care or treatment	☐	☐	☐
B. The understanding / responsiveness of care providers to your health needs	☐	☐	☐
C. The quality or continuity of the treatment or care that you receive (quality)	☐	☐	☐
D. The fees/charges that you pay towards treatment/medicines (cost)	☐	☐	☐
E. Seeking treatment can make you or your family feel embarrassed (stigma)	☐	☐	☐
F. You dislike taking medication or taking it can make you feel unwell (side-effects)	☐	☐	☐
G. Other reason(s) for using / not using treatment services (specify)	☐	☐	☐

_____

3. Please list medication prescribed to the patient for emotional problems <u>in the last 8 weeks</u>:

Generic (and brand) name of drug e.g. Fluoxetine (Prozac)	*For how many days? (max = 56 days)*	*Dose per day (mg)*
A.		
B.		
C.		
D.		

4. <u>In the last 8 weeks</u>, has the patient, a family member or friend had to stop or reduce usual work / activities due to the patient's ill-health? 0 = No; 1 = Yes ☐

If yes:	***Patient***	***Family / friend 1***	***Family / friend 2***
A. Relationship to patient	-		
B. a) No. of <u>days</u> in the last 8 weeks			
<u>or</u>:			
b) No. of <u>hours per week less</u>			
C. <u>Type of work</u> forgone *(1-3; see key below)*			
D. If applicable, <u>income lost per day</u> *(before tax & other deductions)*			

<u>Key</u>: Type of work forgone: 1 = unpaid housework (e.g. housewife)
2 = manual work (e.g. agricultural or factory worker)
3 = office / non-manual work (e.g. skilled worker, business, professional)

GUIDELINES FOR THE ECONOMIC ANALYSIS OF COMMUNITY MENTAL HEALTH CARE PROGRAMMES IN LOW-INCOME COUNTRIES

Contents

The guidelines:

i) have been drawn up in order to provide an overview of issues, principles and procedures related to the economic analysis of mental health care programmes in low-income countries.

ii) are aimed at mental health workers who have an interest in incorporating an economic perspective into their evaluative research activities.

iii) are largely based on the principles and methods used in the US and UK, but also reflect an additional set of features associated with the implementation of these methods in the context of low-income countries

iv) do not attempt to be comprehensive, and it is recommended that a local health economist or closest equivalent is consulted in their application.

A. The rationale for an economic perspective

The increasing recognition of mental health as a significant public health issue globally has led to additional demands for resources that are already stretched. There is therefore a requirement to demonstrate that investment of resources into mental health care and prevention is needed and worthwhile. This translates into generating evidence on affordable and cost-effective mental health care and prevention strategies. Economic evaluation provides a methodology that allows policy makers, managers and clinicians to make choices between differing treatments, settings and illnesses in order to facilitate the judicious use of scarce resources. The current lack of mental health economic evaluative studies in low-income countries is a significant stumbling block to the investment of resources in mental health by governments and international agencies.

B. Principles of economic analysis

Key to the understanding of an economic approach towards mental disorder is the notion of resource scarcity, since this necessarily prompts the requirement to make choices between different courses of possible action or investment. Making a choice implies in turn the sacrifice or foregoing of the alternative action or investment. The economic approach therefore attempts to value the worth of a particular resource, decision or strategy with reference to its 'opportunity cost', namely the value attached to the next best alternative. To give an example, the opportunity cost of an acute psychiatric bed is derived with reference to the alternative use with which those resources could be put to, such as within another medical speciality, outside medicine completely, or investment into an interest-bearing savings account. A further important principle of economic analysis is that it takes a broad, societal perspective, such that account is taken of costs falling to all relevant parties; for example, allowance should be made for inputs of unpaid volunteers/family carers as well as formal care inputs.

C. Planning and designing an economic study

For an appropriate economic evaluation of a mental health care intervention, programme or strategy, a number of study design features need to be considered. Since economic evaluations often take place alongside clinical evaluations or trials, the design of the study will typically need to be agreed in conjunction with other evaluators. The most desirable design requirements for the economic evaluation of a mental health care intervention revolve around the presence of a control group (against which to draw comparisons with the intervention group), and the prospective follow-up of these two groups over time (one year would be sufficient for most studies) . This 'experimental' study design is the 'gold standard' of clinical and economic evaluation, since it is able to demonstrate most clearly that changes in selected measures are attributable to the intervention, as opposed to other possible explanatory factors ('confounding' variables). Where it is not possible or practicable to carry out an experimental study, an observational study design can be used; this design may have better external validity - preserving the context in which care is provided – but shifts the focus of the analysis towards identifying associations between the intervention and changes in costs or outcomes (as opposed to attributing a causal relationship). A further desirable is recruitment of a sufficient sample of patients and/or centres to show statistically significant changes between groups (at least 100-200 subjects per group is probably required); the sample size necessary to show a significant economic difference may be greater than that necessary to show a clinical difference between study groups.

Alongside decisions regarding the most appropriate study design, consideration must also be given to the mode of economic evaluation (that is, the manner in which costs and outcomes data are to be combined). The simplest of cost evaluations is commonly referred to as *cost-minimisation analysis*, but this is only appropriate if it is known that outcomes are identical (very unlikely), in which case the task is merely to establish the least cost method of achieving these outcomes. A much more common mode

of economic evaluation in the field of mental health care is *cost-effectiveness analysis*, which assesses not only the costs but also the outcome of an intervention, expressed in terms of cost per reduction in symptom level, cost per life saved, etc.. Where there is more than a single measure of outcome being investigated, as is often the case in psychiatry and related fields (see E iii below), it is more correct to label this type of study as a *cost-consequences analysis*. This mode of evaluation is likely to represent the default choice in most contexts, and has the advantage of presenting an array of outcome findings to decision-makers. A further mode of evaluation is *cost-utility analysis*, which has considerable appeal for decision-makers since it generates equivalent and therefore comparable study data ('utilities', expressed by a combined index of the mortality and quality of life or disability effects of an intervention), upon which priorities can then be based. However, there are technical difficulties in using this approach, and where it has been used in psychiatry, it has not performed very well to date. The final option is *cost-benefit analysis*, which refers to a form of evaluation in which all costs *and* outcomes are valued in monetary units, thereby allowing assessment of whether a particular course of action is worthwhile, based on a simple decision rule that benefits must exceed costs. This approach is difficult to undertake because of the requirement to quantify outcomes in monetary terms, and consequently is found very rarely in mental health care evaluation.

One other key decision to make at the design stage of the study is the scope or perspective of the evaluation. This refers to the viewpoint from which the analysis is being taken, which, in ascending order of comprehensiveness, might be that of a particular agency or government department (e.g. ministry of health), the statutory/formal sector as a whole (e.g. including social services), or a societal perspective which assesses the impact of the intervention on all agencies, including patients themselves as well as their carers or households. The choice of viewpoint, which will influence what costs and outcomes are to be measured, should be determined according to whether the intervention under study is expected to exert a differential impact on these various agencies/sectors.

In summary, it is possible to list a number of stages which typically comprise the conduct of an economic evaluation, all of which need to be considered and carried out in order to obtain a valid and reliable set of findings:

i) definition of the alternative interventions to be evaluated (design);

ii) identification of the costs and outcomes to be included in the study (scope);

iii) quantification of these identified costs and outcomes (valuation);

iv) comparison of costs and outcomes (analysis);

v) revision of findings in the light of risk, uncertainty and sensitivity (qualification); and

vi) examination of distributional effects (equity implications).

D. Data collection

i) *Resource utilisation*: The collection of service utilisation data at the level of the individual patient enables the generation of detailed information on the consumption of a wide range of resources. Opportunity cost estimates can be applied subsequently to these data in order to calculate the overall economic costs associated with an individual's care, or at a more aggregated level, a particular intervention or strategy. An initial stage in the recording of resource utilisation data is the identification of relevant components of potential service receipt by users, such as contacts with primary care physicians and other health workers, community-based private or voluntary sector providers and hospital inpatient and outpatient care (both psychiatric and general). Services to include will differ with respect to a number of evaluative concerns, including the scope, objectives and setting of the study, as well as the particular service needs of the client group(s). For example, users with more severe or enduring mental disorder, such as persons with a diagnosis of schizophrenia, often need a wider range of service supports than people with common mental disorders such as depression and anxiety (e.g. day care services and residential care). For economic analyses carried out alongside clinical evaluations (the expected norm in this context), the most convenient means of data collection is often via an interviewer-administered service receipt schedule, which can record service use over defined retrospective periods at the various assessment points of the study (see Appendix 1 for a generic example of such a schedule). It is also important to ensure that data is available or collected on the socio-demographic and socio-economic characteristics of the individuals, including lost opportunities to work (this latter category may be an important economic outcome).

ii) *Resource costs:* For each item of resource utilisation, a unit cost estimate is required, such as a cost per inpatient day, or cost per contact with a primary care worker. It will be necessary to compute these estimates using a range of data sources, including national/local government statistics, health authority figures and specific facility or organisation revenue accounts. The broad perspective to be employed in the costing of services is an economic one, such that in principle service costs are derived by reference to their *marginal long-term opportunity costs.* In practice, derivation of costs in this way is difficult. It is therefore common to use *short-term average costs* as a proxy for long-run marginal costs. The main categories of cost that need to be quantified for each service are:

- *Salaries / wages of staff* employed in the direct care and management of patients. Salary costs can be obtained from local or national pay scales. The ideal salary value to use is a weighted average of all grades on a pay scale. Supplementary (fringe) benefits, bonuses and allowances should be included. Also include employer contributions to local/national taxes, pension or health insurance schemes etc., which can be given as a percentage add-on to the salary/wage.

- Facility *operating costs* where the service is provided (cleaning, catering, consumables, water, electricity etc.). This covers the costs associated with running the establishment where the

professional is employed, for example a rural health centre. This can be worked out by dividing *pro rata* the total running costs of the establishment (excluding capital costs or rent) by the total number of 'full-time equivalent' staff. For government facilities, these costs can usually be obtained from the finance or planning departments of local or federal government.

- Any *overhead costs* relating to the service (personnel, finance etc.). Costs associated with service management and administration, such as finance and personnel functions, are often difficult to identify with accuracy, and it may only be possible to establish a percentage add-on to known revenue (operating) costs.

- The *capital costs* of the facility where the service is provided (land, buildings etc.). The (opportunity) cost of capital is calculated as the annuity (the constant stream of payments arising from interest, taken to be the best alternative use for the capital) which will deplete the lump sum value over the lifetime of the capital. *The lump sum value* can be obtained from government contracts for similar buildings. The *lifetime* of land and buildings is best set at 20 years, and the lifetime of equipment (including furniture and vehicles) can be set at 5 years. The other determining feature of the *annuity factor* is the prevailing discount rate for public and/or private capital assets (this should be available through local government offices). For example, using the 5% discount rate, a hospital worth $500,000 would have an annual capital cost of $40,122.

In order to reach a unit cost of contact time, the aggregate of these cost components needs to be divided by the typical availability of the service or the working time of the professional (for example, 35 hours per week, with 4 weeks holiday per year and 1 week sickness leave allowance). See Appendix 2 for an example of a unit cost template for a primary health care centre.

It should be emphasised that economic or opportunity costs are *not* the same as market prices, charges, fees or per diems. Profit motives, varying accounting and reimbursement practices mean that the use of per diems and hospital charges may not represent a good proxy of opportunity cost. For example, a private, for-profit company may charge a fee above what it actually costs to provide care. Where used, this should be clearly stated and, if possible, adjusted to reflect the real economic cost.

iii) outcomes: There is an important distinction to be made between indicators of intermediate outcomes and final outcomes. The former category, which can also be referred to as process indicators, should not ideally be the focus of the analysis, since positive changes in, for example, attendance or detection rates may not in fact result in improved patient welfare or mental health. Thus, while process indicators are undoubtedly an important source of differentiation between study samples at the institutional level, their use as indicators of improved patient welfare needs to be treated with caution. Final outcomes, on the other hand, are concerned with detecting changes in the physical, psychological or social well-being of individuals, and commonly revolve around the measurement of symptoms, functioning and disability, quality of life and service satisfaction.

iv) local service structures: The take up and subsequent effectiveness of services is determined to a significant extent by the access, availability and quality of mental health services. Without comparable and standardised descriptions of the structure and content of service systems, analysis of the role of organisational characteristics in evaluating costs and outcomes is severely compromised. It is therefore vital to have an understanding of the features that characterise each site's local service system. Data is needed at a local area level in two domains: *sociodemography*, to include the age, sex, education and employment profiles of the population; and *primary and secondary health services*, to include the structure, organisation and financing of both general medical and mental health services, plus the availability of / access to these services to / by the population(s) under study.

E. Data analysis and presentation

Economic evaluation provides a means of comparing the costs and outcomes of a mental health care intervention or programme together in an explicit framework. This in turn enables decision-makers to assess the extent to which the intervention or strategy offers a good use of (scarce) resources. An analysis of costs alone, or indeed of outcomes alone, does not provide such information. In analytical terms, there are a number of scenarios that can be considered when assessing whether an intervention represents a worthwhile use of resources:

- If statistical analyses of cost and outcome data show that the new intervention is both significantly less costly and more beneficial than the control group (usual care), then one can immediately conclude that the intervention is preferable. Likewise, usual care is the preferred choice when it is cheaper and more effective.

- If the costs and outcomes are found to be equivalent, then either is acceptable. If only cost is equivalent, then the more effective intervention is preferable, and if only outcome is equivalent, then the cheaper intervention is preferable.

- When the evidence shows that one of the two (or more) interventions is both more costly and more effective, it is necessary to assess whether the additional costs is worth the greater effectiveness. This can be established by calculating a cost-effectiveness ratio (the difference in cost over the difference in outcome between the experimental intervention and the control or comparison group). The ratio is positive when one of the groups both costs more and produces a superior outcome. For example, an intervention that i) costs an extra Rupees 1000 over a year and ii) produces an additional improvement of 5 points on a social functioning measure compared to usual care, would result in a positive ratio of Rupees 200, interpreted as the increased average cost necessary to gain an average of 1 point of improvement per year. The cost-effectiveness ratio is negative when the innovative intervention costs less but has superior outcomes (i.e. cost saving), or when the innovation costs more but produces worse outcomes (i.e. a bad investment).

In any of these circumstances, the usefulness of these estimates depends on the validity and credibility of the evidence about the sampled populations of the study, and this is never perfect. A key activity of the analysis stage of an economic evaluation is therefore to carry out a *sensitivity analysis*, which involves the introduction of alternative values to key study parameters (such as the cost per inpatient day, or the rate at which capital costs have been discounted) with a view to assessing whether overall conclusions are robust to these plausible changes to values or whether in fact results are very sensitive to such changes.

While the addition of economic analysis to mental health care evaluations introduces an extra dimension that offers a wider assessment of the implications of new or existing courses of action, it is important to mention some of the limitations of the approach. Many economic evaluations fall short of the ideal, whether that be in terms of sample size, or comprehensiveness of cost and outcome measurement. Conclusions based on a small trial with less than 50 subjects per arm can often only be tentative, while the failure to measure the indirect consequences associated with two alternative treatments (such as lost opportunities for work) may give rise to misleading results. There are also a number of ongoing methodological debates with respect to certain aspects of economic evaluation, such as the alternative techniques available for measuring health state preferences (essential for both cost-utility and cost-benefit analysis). In this context, it is worth noting that economic evaluation is no panacea for making difficult allocative and policy decisions; rather, it is one additional tool that together with clinical and social dimensions can facilitate explicit, evidence-based decision-making.

Contact point

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Further reading

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